EDITORIAL STAFF

E. L. Shaner
Editor-in-Chief

E. C. Kreutzberg
Editor

A. J. Hain
Managing Editor

E. F. Ross
Engineering Editor

Guy Hubbard
Machine Tool Editor

D. S. Cadot
Art Editor

ASSOCIATE EDITORS

G. H. Manlove — J. D. Knox
W. G. Gude — G. W. Birdsall
W. J. Campbell

New York
I. H. Such — B. K. Price
L. E. Browne

Pittsburgh — R. L. Hartford
Chicago — J. F. Powell
Detroit — A. H. Allen
Washington — L. M. Lamm

London
Vincent Delport

BUSINESS STAFF

G. O. Hays
Business Manager

C. H. Bailey
Advertising Service

New York . E. W. Kreutzberg, B. C. Snell
Pittsburgh . . . S. H. Jasper
Chicago . . . L. C. Pelott, W. F. O'Dell
Cleveland . . . R. C. Jaenke, D. C. Kiefer

J. W. Zuber
Circulation Manager

MAIN OFFICE

Penton Building, Cleveland

BRANCH OFFICES

New York . . . 110 East 42nd St.
Chicago . . Peoples Gas Building
Pittsburgh . 1800 Koppers Building
Detroit . . 1010 Stephenson Building
Washington . National Press Building
Cincinnati . . . 282 Sinton Hotel
San Francisco . . 1100 Norwood Ave.
Oakland, Calif., Tel. Glencourt 7559
London . . . . Caxton House, Westminster, S.W. 1
Berlin . Berlin, N.W. 40, Roonstrasse 10

• ● •

Published by The Penton Publishing Co., Penton Building, Cleveland, Ohio. John A. Penton, Chairman of Board; E. L. Shaner, President and Treasurer; J. R. Dawley and G. O. Hays, Vice Presidents; F. G. Steinebach, Secretary.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States, Cuba, Mexico and Canada, one year $4, two years $6; European and foreign countries, one year $10. Single copies (current issues) 25c.

Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1939 by the Penton Publishing Co.

STEEL

ESTABLISHED 1882

Steel Established 1882

Contents

Volume 104—No. 16 **April 17, 1939**

READER COMMENTS 17

AS THE EDITOR VIEWS THE NEWS 21

NEWS
- Preparing Nation's Armed Forces for Emergency 23
- Spain's Iron Ore Resources Substantial, but Not Sufficient for "Axis" .. 26
- Steelworks Operations for Week 27
- Financial News of Steel Industry 27
- Sales Pointers from Managers 28
- Men of Industry 29
- Obituaries 31
- Defines Safety's Dollar Value 35
- Aviation 35
- Activities of Steel Users and Makers 40
- Meetings 40
- Ohio Society Honors Steelmen 41

WINDOWS OF WASHINGTON 32

MIRRORS OF MOTORDOM 37

EDITORIAL—Sticking Necks Out 42

THE BUSINESS TREND
- Outlook for Second Quarter Clouded by War Scares 43
- Charts and Statistics 43-45

TECHNICAL
- Making Inexpensive Dies 46

PROGRESS IN STEELMAKING
- Foundry Iron 48

OPEN HEARTH CONFERENCE 50

MATERIALS HANDLING
- Electric Motor Cores—Part II 59

JOINING AND WELDING
- A Plant Weldery 66

HEAT TREATING
- Valve Steels 70

ALLOYS
- Oil Well Bits 76

AMERICAN FOUNDRYMEN'S CONVENTION PROGRAM 78

INDUSTRIAL EQUIPMENT 80

MARKET REPORTS AND PRICES 87
- The Market Week 88

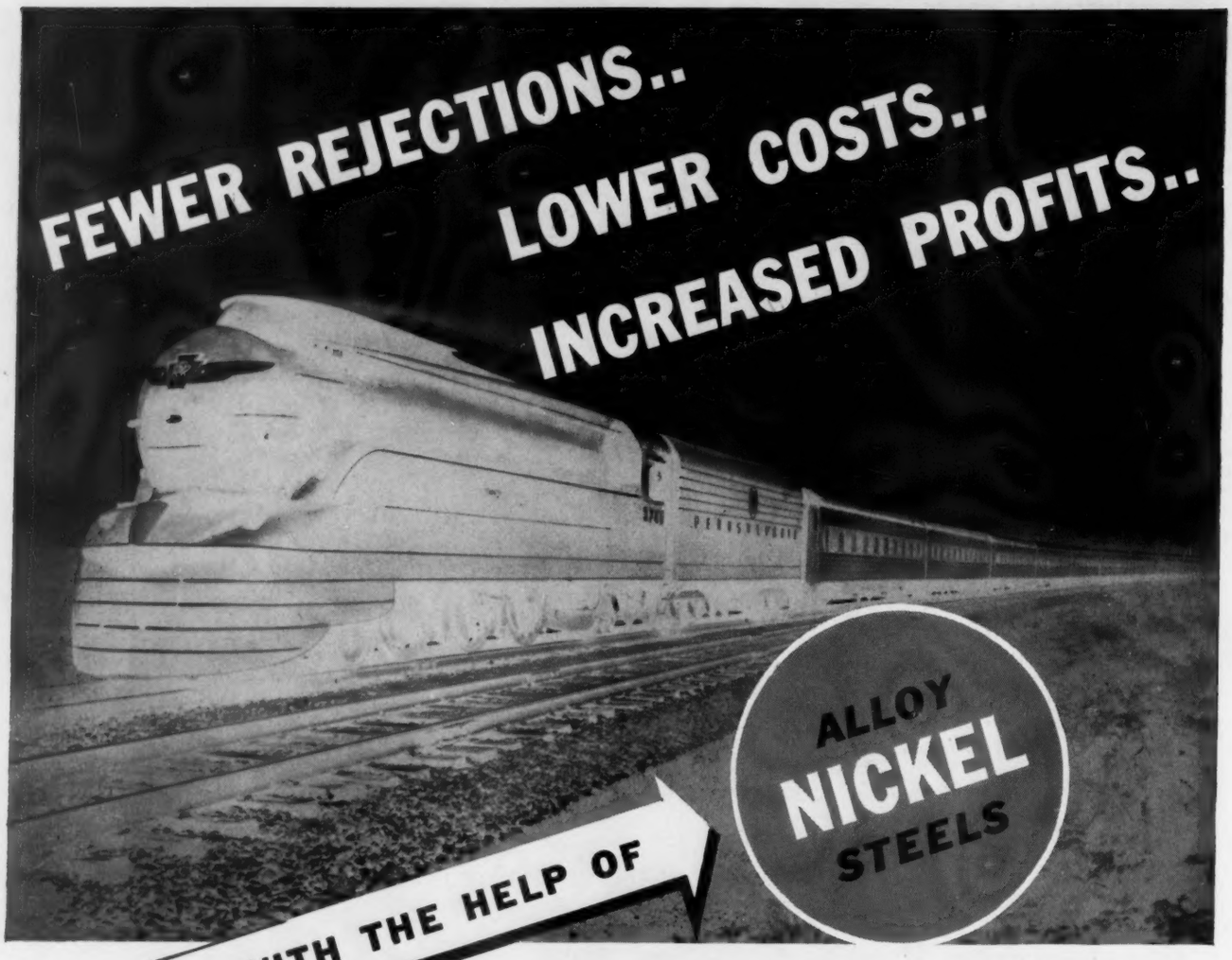
BEHIND THE SCENES 102

CONSTRUCTION AND ENTERPRISE 110

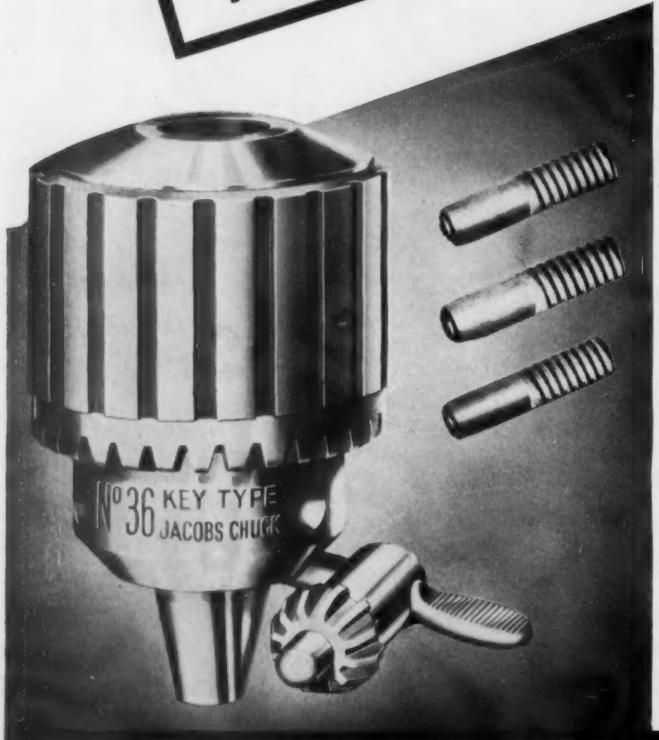
INDEX TO ADVERTISERS 116

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FEWER REJECTIONS.. LOWER COSTS.. INCREASED PROFITS..



..WITH THE HELP OF ALLOY NICKEL STEELS



MODERNISM brings new customers and new profits to railroads. Typical is the "Broadway Limited," leader of the Pennsylvania's fleet of nine new streamliners. From car truck frames of Nickel alloy cast steel to Nickel-copper-molybdenum steel roofs, Nickel saves weight, lengthens service life and pushes down cost per mile and cost per year.

WHETHER you're hauling extra fare passengers, or doing precision machining—Nickel can make each ounce, each inch of metal do more work at lower cost per year.

Nickel, alloyed into steels, irons or non-ferrous metals, provides improved mechanical properties. The heightened abilities of Nickel alloyed materials cut rejects during production, lower machining costs, and increase profits by lengthening service life. For specific information about money-saving applications of Nickel in your industry, please address your inquiry to the address below.

REJECTIONS CUT 75%—"Since using Nickel steel (SAE 4615) rejects due to warpage in heat treatment have dropped 75%," says Jacobs Mfg., Co., Hartford. "This Nickel-molybdenum steel provides required hardness and toughness in drill chuck jaws, plus added core strength to prevent bending or breaking. Nickel alloyed chucks *stay* accurate—assure accurate boring and machining."

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N.Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ WAR THREATS in Europe and uncertainty as to the extent to which the United States would be affected continue to influence business sentiment adversely. The recent recession in business volume has gained a little more momentum. Steel production last week (p. 27) receded two points to 51½ per cent of ingot capacity. Scrap prices (p. 92) have weakened further as a result of the less favorable outlook for steelmaking. Although motorcar assemblies (p. 38) increased about 1000 units last week, parts production has tapered and little additional steel buying is in sight (p. 87) over the remainder of the 1939 model year. . . . On the other hand, our national military preparedness program (p. 23) is moving to the stage where huge additional orders soon will be released to industry.

• • •

Limits Unions

Latest state to outlaw certain tactics of organized labor is Wisconsin which (p. 41) limits the term "labor disputes" to actual disagreements between employers and employes resulting in a strike or lockout, and which prohibits "stranger picketing." At Washington (p. 32), examination with a view to amending the Wagner act is under way. . . . How extensively is Germany fortified with reserves of that vital mineral, iron ore? STEEL'S survey (p. 26) reveals she has no really large or rich deposits and is dependent at least 40 per cent on foreign supplies. . . . Early indications (p. 27) point to the probability that most of the large steel companies will report a small net profit on first quarter operations.

• • •

Profits In Safety

An authority on safety estimates (p. 35) that the United States Steel Corp. has profited by more than $300,000,000 on its investment of $26,000,000 in safety since 1912. . . . Displeased with the one-sided story which the federal trade commission recently told about the steel industry, the temporary national economic committee has decided (p. 34) to let industry hereafter tell its own story about the nation's economic problems. . . . The Wheeler-Truman bill (p. 34) would prohibit a carrier from transporting commodities owned by its parent company; such prohibition would affect industrially owned railroads, pipelines and water carriers. . . . The bureau of public contracts (p. 34) amends its definition of a "dealer" and defines a "machine tool dealer."

• • •

Narrow Field?

A new process permits economical production of dies for die castings and molds for plastics. Dies are electroformed as shells which (p. 46) then are backed with bronze, brass or iron. . . . A southern metallurgist (p. 48) answers the question: "Why does iron made from brown ore give better results in the gray iron foundry than iron made from red ore?" . . . A well-known metallurgist (p. 84) deplores the flood of new varieties of tool steels and cutting materials; he urges co-operative action by producers to narrow the field to a few types of materials so as to avoid confusion among consumers. . . . Oil well bits are required to give unfailing service under severe conditions of abrasion and strain. Certain new alloys (p. 76) give good results in this use.

• • •

Steelmen To Confer

Last year's joint open-hearth and blast furnace conference was unusual in that it was attended by representatives of practically the entire iron and steel industry in this country. An extensive program has been arranged (p. 50) for this year's conference, to be held in Cleveland, April 26-28. Five sessions will be held by the open-hearth and three by the blast furnace group. . . . For the forty-third annual meeting of the American Foundrymen's association an elaborate program has been arranged (p. 78); the meeting is to be held in Cincinnati, May 16-18. . . . Three groups of steels, one relatively new, now are in general use in the manufacture (p. 70) of automotive engine exhaust valves. . . . Using thoroughgoing organizing methods (p. 66) an electrical equipment manufacturer has created an extremely successful weldery.

E C Kreutzberg

"That Mark Steers You Clear of Trouble"

"Sure, I've seen all kinds of sheets go through the works," says a veteran of more than 20 years in a big automobile body plant.

"Yes, they're all made of steel. So are all cigars made of tobacco, but you don't get the same satisfaction from all cigars. Sheets can vary, too.

"I'll take Inland Sheets because that diamond trade-mark steers you clear of a lot of trouble, and the men from Inland are on the job every day watching quality and service."

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Preparing Nation's Armed Forces for Emergency; Steps Affecting Industry

WASHINGTON

■ DESPITE the economy wave which has swept over congress in recent months, the army and navy have been dealt with generously in appropriations for preparedness.

At the beginning of the present session President Roosevelt asked for $552,000,000 for emergency defense purposes. Appropriations made so far this year for both arms of the national defense have exceeded those of any other peace-time period in the nation's history.

If congress' plans come to fruition the United States army will be one of the best equipped in the world, backed strongly by industries on which it depends for supplies.

Present program will provide this country with 9000 military airplanes, 6000 for the army and 3000 for the navy, by the close of fiscal year 1941. The recently passed $358,000,000 defense measure authorizes the army to spend $170,000,000 in expanding its air power. The same act makes provision for strengthening Panama canal defenses, furthering the program to train student fliers, and increasing industrial educational orders.

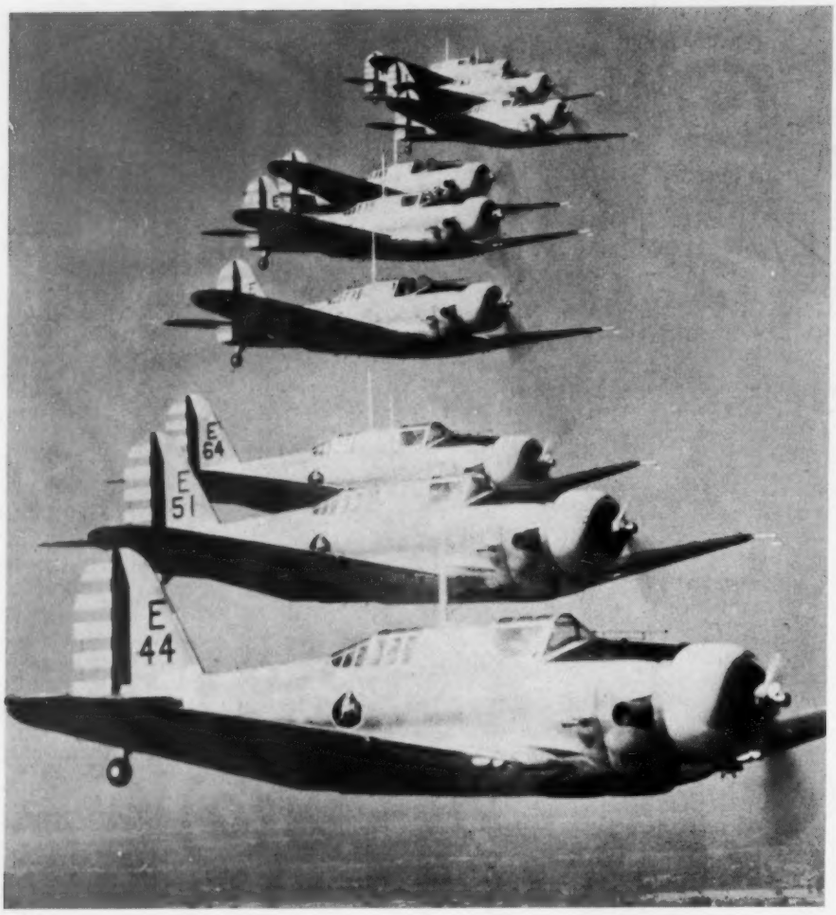
A deficiency bill appropriating $186,000,000 also has become law, giving the army $116,000,000 for equipment and seacoast defenses. Most of this money will be used to purchase semiautomatic rifles, light and heavy artillery, tanks, antiaircraft guns and the like. Another bill appropriates $17,000,000 for air defense construction in the Panama canal zone.

The army air corps' authorized strength approximated 2400 planes of various types, until the recent measure increased this number to 6000. The bill specifically calls for 3532 planes in addition to those already on hand or on order. This will raise the total by 1941 to approximately 6000, of which number it is contemplated that about 2500 will be held in reserve, without personnel. More than 1300 of the reserve planes will be of the combat type. The war department is devising means to assure increased balanced productivity by private aircraft plants. War department officials are consulting with aircraft manufacturers to reach a sound solution to this problem.

Another matter highly important to the army is that of educational orders. President Roosevelt last week wrote to Speaker Bankhead, urging early appropriation of the $32,500,000 authorized for such orders by the emergency defense bill. This with the $2,000,000 appropriated last year would make available $34,500,000. Army officials are forging ahead with preparations for the orders.

When only $2,000,000 appeared available this year the war department announced it had selected certain items for educational manufac-

■ **Vital in warfare are ground defenses against air attack. Many more antiaircraft guns of this type are said to be needed by the army. U. S. Army Signal Corps photo**



■ **Symbolizing America's growing strength in the air, these latest army attack planes were built by Douglas Aircraft. Under present program, army and navy fighting airplanes will total 9000 at the close of fiscal year 1941**

ture, including "semiautomatic rifle; recoil mechanism, 3-inch antiaircraft gun; forging, 75 mm shell; machining, 75 mm shell; gas mask; and 60-inch searchlight." There is no doubt that later this year others will be added to the list.

Louis Johnson, assistant secretary of war, has directed that the articles be essentials, should be standard for procurement in war, with the probability of remaining standard for a considerable time. They must also be noncommercial in character, and required in such large quantities, or be of such intricate nature, that education of the industries in their production is necessary.

Bills relating to strategic minerals are pending in both houses. As originally provided in one measure, $25,000,000 per year was to have been spent for a four-year period to acquire stocks, with $2,000,000 over the four-year period for investigations by the bureau of mines.

Bill already passed by the senate reduces the $25,000,000 to $10,000,000 per year for a four-year period. A like expenditure is contemplated by the house in a pending measure. These bills provide for purchasing and storing raw materials such as manganese, aluminum, and other items not produced in the United States in quantities sufficient for war purposes.

Pending defense legislation would increase the regular army to 220,000 officers and men, compared with 180,000 today; national guard would comprise 210,000. It is estimated by army officials it would cost $420,000,000 to arm and equip this initial protective force. Experts say the sum would equip 15 regular and national guard antiaircraft regiments, and 34 infantry regiments. It would furnish gas masks at $9.25 each; medium tanks at $46,000 each; 37 mm antiaircraft guns at $20,000 each; semiautomatic rifles at $80 or less; and other needed equipment.

Improve Coastal Defenses

Panama, Hawaii, and the United States will have their coastal defenses strengthened under an appropriation of some $6,500,000. Bill provides for additional antiaircraft guns, railway guns and fixed fortifications. Congress also has authorized the garrison at the Canal Zone be increased by 6400 men and 180 officers, bringing the total to 21,000. New housing is to be provided, which together with pay for the additional personnel, subsistence and transportation will cost some $24,000,000.

Included in emergency defense plans is provision that the secretary of war enroll at the air corps student training center selected members of the instructional staffs of civilian flying schools. This will enable the war department to keep instructors at civilian schools, to which army men are detailed for training, in close touch with the curricula and methods of the air corps center, and will serve to coordinate the instruction at both classes of schools. The war secretary also may lend aircraft and other aeronautical equipment to these civil schools for instruction and training of army personnel.

Air Specialists Needed

Under its expansion program the air corps will require additional pilots, mechanics, and other specialists. The army's present training facilities being insufficient, it will be necessary to utilize certain accredited civilian aviation schools.

The navy is not lagging in bringing its fighting force up to date, although its appropriation bill has not yet been reported by the house appropriations committee. Obviously, a navy cannot be built overnight. It takes five years to construct a battleship, and another year to get its personnel into shape for operations.

A navy is unlike a land force in the matter of training. A four-year enlistment is said to scarcely start a sailor on his career. Army expansion will prove a quicker job.

America is now building six battleships of 35,000 tons. Recently the navy department asked congress for funds for two 45,000-ton battleships, largest in the world. President Roosevelt endorsed these ships, giving Admiral William D. Leahy, chief of naval operations, authority for their construction. It was stated at that time certain other nations intended to build 45,000-ton capital ships, and under the 1938 construction act the President has discretionary power to meet such tonnage.

Navy department officials who appeared before a house subcommittee on appropriations during hearings on the $750,000,000 naval budget estimates, proposed these two battleships be included in next year's building program. The ships would cost from $80,000,000 to $100,000,000 each.

President Roosevelt has asked congress for an additional $19,500,000 navy appropriation. He proposed that $16,000,000 of the budget estimates for ship construction be spent for new equipment and facilities at navy yards and stations. Total proposed for the navy next year now stands at about $750,000,000.

Included in the supplementary

$19,500,000 is $14,000,000 for construction and procurement of aircraft; $4,000,000 for ordnance; $300,000 for tools and machinery at the Norfolk, Va., training station; $225,000 for improving the New London submarine base; and $354,000 for the naval reserve.

Navy's 1938-1939 ship construction program provides: four battleships, 35,000 tons each; six submarines, 1450 tons; and eight destroyers, 1500 tons. Also included are one destroyer tender; one submarine tender; two seaplane tenders; two mine sweepers; three fleet tugs; and two oilers. Other ships on the program for which bids have not yet been received include an aircraft carrier; four cruisers; one mine layer; and one oiler. Total cost of this one-year building program is not available, but the ships cost from $52,000,000 for the battleships down to about $1,000,000 for the tugs.

The complete construction program as of Feb. 1 involves six battleships; one aircraft carrier; one heavy cruiser; two light cruisers; 16 submarines; 39 destroyers; two destroyer tenders; two mine sweepers; one submarine tender; three fleet tugs; and four seaplane tenders.

"Best Navy" Urged

"A second best navy is like a second best poker hand," says Charles Edison, assistant navy secretary. "It has some importance during the bluffing operations, but when a showdown comes there is only one winning hand."

Mr. Edison contends that if we need a navy at all, "we need one that can defeat any probable enemy or probable combination of enemies."

■ This high-speed army tank is entirely off the ground after taking a hurdle. U. S. Army Signal Corps photo

Due to the increasing world unrest, the President and congress in 1933, after a decade of practically no naval construction, authorized 32 new vessels. This exceeded the total authorized between 1922 and 1932. During that decade, ship design and building became almost a lost art in the United States, falling far behind industry in the far reaching and rapid advances that had been made in engineering.

In 1934, the President again recommended to congress that the fleet be built up to the tonnage allowed under the naval treaty. Congress accordingly passed the so-called Vinson-Trammell act, providing for 141 additional ships of various categories. The naval treaty having expired, President Roosevelt asked congress to exceed the treaty limits by 20 per cent. Under legislation passed last year, 46 additional fighting vessels and 22 auxiliaries were authorized.

Through the present naval building program, industry is gaining practice in activities essential to preparedness. Co-operation and co-ordination with the army in the matter of industrial preparedness is the subject of continued study by the army and navy munitions board.

■ Mightiest units in Uncle Sam's fleet, battleships are armored with steel plate, which at some areas is 18 inches thick. Now building are six 35,000-ton craft, with two more of 45,000 tons being considered by congress

Speeds Construction Program

Task of co-ordinating the navy's shipbuilding program has been delegated to Assistant Secretary Edison. Such co-ordination has comprised reducing as far as possible changes during construction; rushing a program for expanding and modernizing navy yard facilities with new machine tools; canvassing the commercial field for every possible aid in completing the building program; increasing supply sources; acquiring stock piles of strategic and critical materials; improving contract terms; and continuing fair standards of labor management.

It is to be borne in mind the government's fiscal year ends June 30. During the year ended June 30, 1938, construction for replacing over-age vessels and aircraft aimed to bring our naval strength up to that authorized by the Vinson-Trammell act of 1934. Work was started on two battleships provided in the 1937 naval appropriation act, and on eight destroyers and four submarines provided by the 1938 act. The naval appropriation act for 1939 car-

ries funds to commence replacements for two battleships, two cruisers, eight destroyers, and six submarines. In addition, the deficiency act of June 25, 1938, provided for replacing two more battleships.

Experts declare the sorry condition of the navy's auxiliary ships is only slightly improved. No relief is seen until authorized fighting ship replacements are completed. Nearly all the auxiliaries in commission are slow and over-age, and replacements for them would not be immediately available in the merchant marine in time of war due to the special construction and facilities they require.

Naval aviation has continued its rapid strides in developing aircraft of improved performance. The fleet constantly demands broader and more inclusive roles for aircraft in its tactical organization. The importance of meeting these needs has resulted in assigning greater precedence to aircraft development than to the correlated requirements of supporting tenders and shore stations. Construction of the latter is lagging behind aircraft deliveries. With the naval expansion program in immediate prospect, active measures to increase the number of aircraft tenders and to develop adequate shore facilities are considered essential.

At the beginning of the present fiscal year, the navy had on hand 1390 service and 115 obsolete aircraft, with 642 units on order. This represented a total gain of 205 over the preceding year. Since the 3000-plane limit provided in the 1938 naval expansion act has not yet been attained, an additional increase is anticipated this year.

Navy officers ascertained the effect of bombs exploded on or near a modern battleship. As result of these tests they insist aviation has not supplanted any existing types of ships, but complements them and increases their efficiency. They maintain naval aviation adapts aviation to naval use, and its development must be by the navy.

■ "Steel Over All." Theme cut used extensively in Germany

Spain's Iron Ore Resources Substantial, But Far Below Fascists' Requirements

■ GENERAL FRANCO'S victory in Spain is expected to give his fascist allies, Germany and Italy, access to Spain's substantial mineral resources. Among the most important to the Rome-Berlin axis are the rich iron ore deposits. Also of considerable import are the copper, mercury and lead resources.

Spain's iron ore deposits, especially those in the northern section near Bilbao, long have been famous. They average between 40 and 60 per cent iron. They have been exploited for many years. Since Spain, lacking coal, does little local smelting, most of the ore output has been exported, giving it significance to countries which have insufficient native reserves.

Approximately half Spain's total ore output comes from the Viscaya (northern) district. Santander, Teruel and Almeria contribute about 12 per cent each and 14 other provinces have small reserves. Ores are hematite, siderite, brown and carbonates.

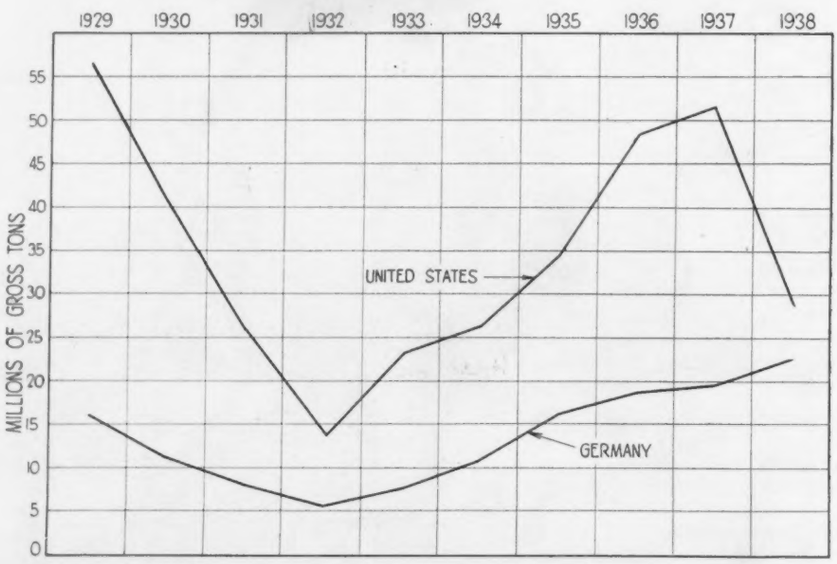
In the past the bulk of Spanish exports went to Great Britain whose capital developed the deposits. Germany and the Netherlands also have been good customers.

Despite their fame, however, the Spanish deposits do not bulk large in the world's production or reserves. They represent less than 2 per cent of the known merchantable reserves, and before production was disrupted by the Spanish civil war, output was only 3 to 4 per cent of the world's total.

Before the Spanish civil war, production fluctuated between 3,000,000 and 5,000,000 metric tons annually. In 1913, Spain's output totaled 10,788,000 tons; in 1928, 5,790,900 tons; in 1932, 3,130,700 tons; in 1933, 3,387,400 tons. Pig iron production in 1932 was only 296,000 metric tons, and in 1933, 334,000 tons. During the civil war, ore, pig iron and steel production dropped sharply.

Ore production, with German or Italian help, can be stepped up from the 3,000,000-ton level of the early 30's. It is improbable, however, that the Spanish surplus, even if all were shipped to Germany, could be sufficient to meet the reich's need for imported ore. Germany must continue to look to Sweden or other sources for a considerable quantity.

Although the Nazis have intensified efforts to make Germany self-sufficient in these resources by building blast furnace plants to work native low-grade ores, experts in Germany agree the output of the reich's deposits probably never will be sufficient to supply



■ Sharp fluctuations have characterized United States' production of steel ingots and castings since 1929; Germany's have been less pronounced. In each of the ten years, United States has been the world's largest producer; Germany has rated second in each year except 1932, when her output was exceeded by Russia

its iron and steel industry's requirements.

It has been estimated that German iron ore deposits are capable of being exploited to provide for only 60 per cent of requirements, and that this percentage could be obtained only by complete disregard for economy in mining and smelting.

In the first nine months of 1938, Germany imported 16,761,833 metric tons of iron ore, compared with 14,988,058 tons in the same period of 1937. This was in addition to increased production of low-grade native ores, and a sharp increase in Austrian ore output.

For all of 1938, domestic iron ore production was 11,000,000 tons, a 25 per cent increase over 1937.

Despite the reich's ore scarcity, its pig iron and ferroalloy production last year was 18,200,000 gross tons, second only to the United States, which produced 19,240,000 tons. The reich's output of steel ingots and castings also was second largest in the world at 22,900,000 gross tons, compared with United States' 28,766,261 tons. Germany's high iron and steel output was made possible by increased use of scrap.

German acquisition of Czechoslovakia gave the reich an interest in the Freja Mining Co. in Sweden, formerly partly owned by the Vitkocvice Iron Works of Moravia. The Freja company produced 376,000 tons of ore in 1937, latest period for which statistics are available. German firms also have recently acquired interests in several other small Swedish mines.

However acquisition of Czechoslovakia and Austria is unlikely to materially change Germany's iron ore situation.

The territory that was Czechoslovakia reached a peak production in 1929 with less than 2,000,000 tons. More than half Czechoslovakia's ore needs have been imported from Sweden. Austria in 1938 is claimed

(*Please turn to Page* 84)

BRITISH STEEL OUTPUT NEAR ALL-TIME RECORD

London — (*By Cable*) — British steelworks are operating practically at capacity. Production of steel ingots and castings in March totaled 1,170,900 gross tons, 199,800 tons more than in February. The March output was only 7400 tons less than the all-time high of 1,178,300 tons, in November, 1937. Pig iron produced amounted to 603,600 tons, a gain of 87,600 tons over February.

Steelworks are busy, mainly due to armament programs. Special steels and tools are in demand.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended April 15	Change	Same week 1938	Same week 1937
Pittsburgh	45	− 4	30	95
Chicago	53.5	None	30	84
Eastern Pa.	40	None	28	59.5
Youngstown	43	− 5	31	86
Wheeling	65	− 1	31	96
Cleveland	39.5	−13	23	76.5
Buffalo	44.5	None	28	90
Birmingham	60	− 2	66	80
New England	35	None	30	97
Cincinnati	51	+ 7	18	86
St. Louis	44.5	+ 2.5	42.4	82
Detroit	59	−10	18	100
Average	51.5	− 2	32	91.5

PRODUCTION

■ STEELWORKS operations last week declined 2 points to 51.5 per cent. Reductions were made in six districts, advances in two, and four were unchanged. A year ago the rate was 32 per cent; two years ago 91.5 per cent.

Youngstown, O.—Declined 5 points to 43 per cent as five open hearths were taken off, leaving three bessemers and 37 open hearths in production.

Detroit — Dropped 10 points to 59 per cent, lowest since August, 1938. Active open hearths number 14 out of 25.

Birmingham, Ala. — Off 2 points to 60 per cent, one open hearth being taken off, leaving 12 active.

Cleveland — Receded 13 points to 39.5 per cent, all interests reducing output. The rate at the close was 3 points below the average for the week.

St. Louis — Increased 2.5 points to 44.5 per cent on expansion by one producer.

Cincinnati — Advanced 7 points to 51 per cent, with a similar schedule likely this week.

Pittsburgh — Down 4 points to 45 per cent. Indications point to further curtailment this week.

Wheeling — Net result of various changes was a reduction of 1 point to 65 per cent.

Central eastern seaboard — Held at 40 per cent for the sixth week.

New England — Steady at 35 per cent. Some semifinished steel is being drawn from stocks.

Buffalo — Remained at 44.5 per cent. One producer may increase its rate this week.

Chicago — Continued at 53.5 per cent for the third week.

FINANCIAL

REPORT MODERATE PROFITS FOR FIRST QUARTER

■ A SMALL profit for most of the large steel producers is indicated for the first quarter on the basis of 54.14 per cent steelworks operations in that period. In fourth quarter, 1938, when the steelworks rate averaged 55.77 per cent, nine of the leading producers reported an aggregate net income of only $13,466,467. However, prices have shown more stability than in the closing months last year.

Reporting to Republic Steel Corp. stockholders at their annual meeting in Jersey City, N. J., last week, T. M. Girdler, chairman, said the corporation made a little money, "but not much", in the first three months. "I think we would have a pretty good business this year if war rumors stopped," he said.

Inland Steel Co. is expected to show a net profit at least as large and probably larger than the $1,759,785, or $1.11 a share, reported in fourth quarter.

Otis Steel Co. is understood to have operated in the black during January and February and it is believed will show a net profit for the first quarter. In the same period last year it had a net loss of $297,379.

Sloss-Sheffield Steel & Iron Co.'s net income for first quarter amounted to about $226,000, Hugh Morrow, president, reported to stockholders. Outlook for second quarter is not so bright due to a rather sharp decline in shipments on contracts in the latter part of March.

FIRST QUARTER STATEMENTS

Rustless Iron & Steel Corp., Baltimore, net profit $207,777, or 21 cents a common share, against net loss $62,651 in first quarter last year.

Transue & Williams Steel Forging Corp., Alliance, O., net profit $7930, equal to 6 cents a share on 134,150 shares. Net loss $68,219 in same quarter, 1938.

Bridgeport Machine Co., Wichita, Kans., net loss $139,264, after charges but before income taxes, compared with $10,338 loss in first quarter, 1938.

Bliss & Laughlin Inc., Harvey, Ill., net profit $134,381, equal to 75 cents a common share. Net loss in first quarter, 1938, was $26,091.

New York Air Brake Co., New York, net profit $107,803, against net loss of $92,268 in the quarter last year.

Van Norman Machine Tool Co., Springfield, Mass., net profit $58,565,

equal to 66 cents a share on capital stock, compared with $117,335 net profit, $1.32 a share, in the 1938 period.

American Forging & Socket Co., Pontiac, Mich., net profit of $50,873 for its second fiscal quarter ended Feb. 28. Net income for first fiscal quarter ended Nov. 30, 1938, was $21,817.

Eaton Mfg. Co., Cleveland, net profit $725,999, equal to $1.03 a share on 703,646 shares. This compares with net loss of $199,042 in the first quarter last year, and net profit of $612,318, or 84 cents a share, in the fourth quarter, 1938.

Westinghouse Electric & Mfg. Co. reports orders in first quarter totaled $50,120,832, or 32 per cent more than in first quarter last year, and largest for any quarter since the second of 1937.

Twin Coach Co., Kent, O., net profit $55,985, or 12 cents a common share. In first quarter last year company had net profit of $21,389, equal to 5 cents a share.

DIVIDENDS DECLARED

Continental Can Co. Inc., New York, interim dividend of 50 cents a common share, payable May 15 to record April 25. A similar dividend was paid Feb. 15.

American Can Co., New York, $1 on common, payable May 15 to record April 25.

Maytag Co., Newton, Iowa, 75 cents a share on the $3 preferred, and $1.50 on the $6 first preferred stock, payable May 1 to record April 15.

Consumers' Net Income 32 Per Cent of 1937

■ STEEL'S tabulation of reports from 184 companies among equipment manufacturers, suppliers and consumers shows an aggregate net income of $107,922,942 in 1938, only 32 per cent of the $335,592,524 net income reported by the identical companies in 1937. Prior tabulations were presented in the following issues: Feb. 13, p. 30; Feb. 27, p. 18; and March 27, p. 17. The subjoined table lists 59. Fifty-five of the 184 companies recorded a loss last year, while only 12 reported a deficit in 1937. All figures are net income, except where asterisk denotes loss:

	1938	1937
Addressograph-Multigraph Corp., Cleveland	$ 906,693	$1,950,802
American Hardware Corp., New Britain, Conn.	78,588	829,669
American Machine & Foundry Co., New York	892,922	1,038,346
Automatic Products Corp., Chicago	53,755*	63,247
Bath Iron Works Corp., Bath, Me.	175,518	20,419
Boeing Airplane Co., Seattle	554,958*	311,683
Borg-Warner Corp., Chicago	19,966*	8,348,089
Canada Wire & Cable Co., Toronto, Ont.	462,655	794,252
Central Foundry Co., New York	415,999*	43,360
Centrifugal Pipe Corp., Jersey City, N. J.	503,902	606,375
Columbus Auto Parts Co., Columbus, O.	70,941	285,908
Consolidated Aircraft Corp., San Diego, Calif.	1,535,110	462,959
Container Corp. of America, Chicago	29,470	1,784,105
Curtiss-Wright Corp., New York	3,598,739	1,983,609
Diamond T Motor Car Co., Chicago	1,154	441,307
Driver-Harris Co., Harrison, N. J.	45,972*	390,555
Durham Duplex Razor Co., Jersey City, N. J.	36,694	7,282
Eisler Electric Corp., Union City, N. J.	21,863*	1,559
Emsco Derrick & Equipment Co., Los Angeles	230,029*	546,131
Ex-Cell-O Corp., Detroit	437,677	655,618
Ford Motor Co. of Canada Ltd., Windsor, Ont.	3,253,176	3,773,043
Foster Wheeler Corp., New York	162,447	101,499*
Giddings & Lewis Machine Tool Co., Fort Collins, Colo.	359,575	249,454
Glenn L. Martin Co., Baltimore	2,349,355	1,144,858
Hamilton Bridge Co. Ltd., Hamilton, Ont.	82,089*	10,956*
Hayes Steel Products Ltd., Merriton, Ont.	79,808	76,486
Hudson Motor Car Co., Detroit	4,670,004*	670,716
Independent Pneumatic Tool Co., Chicago	288,047	1,153,639
Ingersoll-Rand Co., New York	5,219,188	9,726,411
Interlake Steamship Co., Cleveland	428,308	2,540,784
L. A. Young Spring & Wire Corp., Detroit	700,182*	1,477,089
Ludlow Valve Mfg. Co., Troy, N. Y.	32,377*	4,918*
Masco Screw Products Co., Detroit	20,038*	68,613
Midland Steel Products Co., Cleveland	1,450,573	2,320,811
Monroe Auto Equipment Co., Monroe, Mich.	4,880*	53,594
Motor Products Corp., Detroit	619,718*	2,147,130
New York Shipbuilding Corp., Camden, N. J.	532,894	1,372,038
Pacific Can Co., San Francisco	224,029	165,794
Packard Motor Co., Detroit	1,638 317*	3,052,212
Page-Hersey Tubes Ltd., Toronto, Ont.	736,952	1,033,280
Pennsylvania Coal & Coke Corp., New York	287,322*	198,422*
Pittsburgh Screw & Bolt Corp., Pittsburgh	350,948*	1,252,698
Pullman Inc., Chicago	2,295,829	12,275,950
Ralston Steel Car Co., Columbus, O.	128,842*	172,499
Sangamo Electric Co., Springfield, Ill.	519,725	976,996
Signode Steel Strapping Co., Chicago	138,813	408,516
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.	589,645	1,474,827
Sperry Corp., New York	4,961,398	2,949,860
Spicer Mfg. Corp., Toledo, O.	296,874	1,292,709
Standard Steel Spring Co., Coraopolis, Pa.	86,046	362,685
Thew Shovel Co., Lorain, O.	375,384	637,697
Troxel Mfg. Co., Elyria, O.	23,382	37,548
Union Metal Mfg. Co., Canton, O.	101,032	188,830
United Aircraft Products Inc., Dayton, O.	71,340	78,320
Warren Foundry & Pipe Corp., New York	281,053	567,911
White Motor Co., Cleveland	1,825,275*	65,854
Woodward Iron Co., Woodward, Ala.	532,881	1,177,512
Wright Aeronautical Corp., Paterson, N. J.	3,288,772	2,090,192
Yale & Towne Mfg. Co., Philadelphia	68,958	1,326,080

Sales Pointers From Managers

■ MODERN technical selling requires just as much care in sales planning as selling consumers goods, E. O. Shreve, vice president, General Electric Co., declared before the American Management Conference, New York, April 12-13.

Basis for such planning, he said, obviously must be different. Markets should be studied by industries rather than by geographical sections, and considerable attention should be given to the constant shifting of markets. Economic ups and downs differ in various industries and have a more pronounced effect on technical sales than on consumers goods sales.

To illustrate, Mr. Shreve cited the current rise in aircraft and shipbuilding, chemical industry and public works as distinguished from the general level.

Real creative selling, he declared, grows from intelligent application engineering. His own company has found necessary a continuing sales educational program to keep salesmen, sales engineers and application engineers up to date, not only on sales methods and products, but also on product application.

Intelligent and aggressive sales and application engineering in technical selling, he said, often reduce price competition. Many sales are based on the confidence the buyer has in the seller and such confidence in technical lines often rests on the type of technical service rendered.

Discuss Departmental Functions

Discussions of the functions of production, sales, financial, general management and other departments by leaders in many lines developed varying, and in some instances conflicting, opinions as to the proper functions of each and their relationship to each other.

Raymond S. Perry, vice president, Ingersoll Milling Machine Co., Rockford, Ill., said keen interdepartmental competition is needed to provide intensive study of markets, services and products. Top management, however, should be strong enough to fix general policies, co-ordinate departments.

Merrill B. Sands, president, Dictaphone Corp., New York, favored co-ordination between sales departments and top management. Gaps in time between granting of patents on new inventions and mass production and sales of the new product he ascribed to lack of co-ordination.

Yesterday's rewards came largely

from specialization, Mr. Sands granted, but he ventured the opinion those of tomorrow will result from versatility. When sales managers become more conversant with production, finance and other departments, they will become candidates for top management.

A feature of the conference was a sales promotion exposition directed by Leonard J. Raymond, president, Dickie-Raymond Inc. Displayed were 50 sales presentations ranging from elaborate campaigns to booklets and salesmen's portfolios. One entire session was devoted to a symposium on sales at which all departments were represented.

Machine Tool Orders Continue To Increase

■ Domestic machine tool orders increased in March, while foreign orders held at about the February level. Total orders index of the National Machine Tool Builders' association, Cleveland, rose to 185.4, compared with 167.1 in February, and 107 in March, 1938. March was the fourth consecutive month to show an increase.

"The first quarter of 1939 shows a much better degree of participation in the business placed by all companies reporting than the last quarter of 1938," the association reports. "The improvement in domestic business brings with it a better distribution of new orders, throughout the industry."

Scrap Consumption Gains 78 Per Cent

■ Domestic consumption of scrap iron and steel increased 78 per cent in the first two months of 1939, as a result of improved steel mill and foundry activity, while exports declined 26 per cent, according to the Institute of Scrap Iron and Steel Inc., New York.

Based upon a five-year ratio of total scrap consumption to steel ingot production, the apparent melt of scrap in American steel mills and foundries in the first two months was 4,613,000 gross tons. This compares with 2,586,000 tons in the period in 1938.

Meanwhile, scrap exports in the first two months this year totaled 452,797 gross tons, against 613,327 tons in the corresponding period one year ago, according to the department of commerce.

■ Wheeling Steel Corp. has awarded a contract to Koppers Co., Pittsburgh, for designing and constructing benzol refining apparatus and equipment at its Koppers by-products coke plant, Follansbee, W. Va.

MEN OF INDUSTRY

■ WALTER F. MUNFORD has been appointed assistant to vice president in charge of operations, American Steel & Wire Co., Cleveland. He was superintendent of the company's Cuyahoga works in Cleveland.

H. L. Jenter, formerly assistant superintendent at Cuyahoga, now becomes general superintendent of the works, while J. D. Baster becomes superintendent of the cold rolled mills. A. G. Montgomery has been named superintendent of hot mills and V. H. Leichliter, superintendent of the wire mill. Mr. Jenter and Mr. Montgomery have been assistant superintendents at Cuyahoga, which positions have been abolished. Mr. Leichliter formerly

Walter F. Munford

was assistant superintendent at Newburgh wire works, and Mr. Baster, assistant superintendent of the North works, Worcester, Mass.

At Worcester, H. R. Rice succeeds Mr. Baster, while G. E. Hansen becomes foreman of the spring mill, South works, in place of Mr. Rice.

♦

Howard E. Oberg, vice president, Billings & Spencer Co., Hartford, Conn., has been elected a director.

♦

L. W. Greve, president, Cleveland Pneumatic Tool Co., Cleveland has been elected a director of Cleveland Graphite Bronze Co.

♦

Leslie C. Allman has been appointed vice president and director of public relations, Fruehauf Trailer Co., Detroit.

♦

J. L. Hyland, Chicago district operating manager, Republic Steel Corp., Cleveland, has been made chairman of the board of directors, Greater Chicago Safety council.

♦

O. L. Long has been named comptroller, Mercer Tube & Mfg. Co., Sharon, Pa., succeeding Irving Hill, resigned.

♦

Roger Waindle, formerly with Hoskins Mfg. Co., Detroit, is now sales manager, Fahralloy Co., Harvey, Ill.

♦

John E. Dixon, vice president, Lima Locomotive Works, Lima, O., has been elected president, with headquarters in New York.

♦

E. F. Entwisle, general manager, Lackawanna, N. Y., plant of Bethlehem Steel Co., sailed from New York April 7 for a Carribean cruise.

♦

J. R. Burkey has joined Union Metals Mfg. Co., Canton, O., as consulting engineer in the steel piling division.

♦

R. S. Van Note, since 1929 New England representative, C. M. Kemp Mfg. Co., Baltimore, Md., has been named assistant manager of sales.

♦

C. F. Hood, president, American Steel & Wire Co., Cleveland, has been elected a director, Cleveland chamber of commerce.

♦

H. B. Spackman, vice president in charge of sales, Lyon Metal Products Inc., Aurora, Ill., has been made a director.

♦

Paul A. Condit, development engineer, Mason-Neilan Regulator Co., Boston, since 1937, has joined the Cooper-Bessemer Corp., Mt. Vernon, O., as control engineer.

♦

W. P. Woodside, vice president, Climax Molybdenum Co., New York, has been elected a director, Reynolds Spring Co., Jackson, Mich., replacing John W. Miner, resigned.

♦

Lyon McCandless has been appointed vice president, H. K. Porter Co., Pittsburgh. Mr. McCandless also is vice president, Burgess Co. Inc., Beaver Falls, Pa.

♦

J. W. Brussel, factory manager, Federal-Mogul Corp., Detroit, has joined Bendix Aviation Corp., South Bend, Ind. He is succeeded at Federal-Mogul by E. C. Garlent.

♦

L. G. Hagen, assistant to the manager, western railroad sales, Carnegie-Illinois Steel Corp., Chicago, has resigned after 43 years of serv-

ice. D. V. Carlson, who became affiliated with the railroad sales office in 1926, will succeed him.

♦

David P. Graham, manager gas scrubber division, Peabody Engineering Corp., New York, is in Europe on a business trip. He will spend several weeks in England, Holland and France.

♦

George T. Power, district manager of the New York office of Scovill Mfg. Co., Waterbury, Conn., retired April 1 after 55 years' service in the company's sales department.

♦

W. E. Craner has been appointed representative in Houston, Tex., for Stearns Magnetic Mfg. Co., Milwaukee, maker of magnetic separators, clutches and brakes.

♦

Paul Smith, formerly production manager, Warner Electric Brake Mfg. Co., Beloit, Wis., has been named general manager, succeeding William J. Dunn, resigned.

♦

John W. Todd, affiliated for 18 years with Charles Dreifus Co., Pittsburgh, scrap iron dealer, the past ten years as secretary, has resigned.

♦

A. T. Colwell, vice president in charge of engineering, and J. D. Wright, secretary and legal counsel, Thompson Products Inc., Cleveland, have been elected directors.

♦

William E. Burns, heretofore supervisor of precision thread grinder assembly, Ex-Cell-O Corp., Detroit, has been added to the company's sales staff, machinery division.

♦

I. R. Bartter, formerly with the Minneapolis office of Lincoln Electric Co., Cleveland, has been placed in charge of the newly established office in Duluth, at 222 South Twenty-first avenue, East.

♦

Ray Applegate, the past four years with P. R. Mallory Co., Detroit, has been named Detroit agent by Thompson-Gibb Electric Welding Co., with offices at 4-120 General Motors building.

♦

C. R. MacBride has been named manager, engineering service department, A. M. Byers Co., Pittsburgh, being transferred from the Boston division sales office.

♦

William L. Stancliffe and Lester P. Philp have been appointed manager of miscellaneous sales and assistant to the comptroller, respectively, American Car & Foundry Co., New York.

♦

J. J. Mellon, assistant sales manager, Clark Controller Co., Cleveland, has been elected a director. He succeeds Harry K. Fisher, resigned. All other directors and officers of the company have been re-elected.

♦

W. F. Pravel has been appointed district sales manager of Allegheny Ludlum Steel Corp.'s Houston, Tex., territory. He has been with the company since 1934.

♦

Willard Walker, former president and general manager, Walker Mfg. Co., Racine, Wis., has been elected chairman of the board. J. S. Allan is the new president and general manager.

♦

H. L. Berno, vice president, W. H. Davey Steel Co., Cleveland, has been elected president, succeeding William H. Davey, who continues as chairman and treasurer. Harold Davey, district sales manager at Detroit for a number of years, has

H. L. Berno

been elected vice president, and R. S. Easterday has been re-elected secretary.

Mr. Berno, a graduate of Ohio Wesleyan, began his business career with the Mansfield, O., works of Westinghouse Electric & Mfg. Co. He became associated with the Davey organization five years ago as vice president.

♦

L. Brewster Jackson has been appointed sales manager, Wickwire Bros. Inc., Cortland, N. Y., maker of wire cloth, netting and nails, succeeding George H. Kennedy. He has been associated with the firm 14 years.

♦

Clyde C. Mitchell has been appointed sales manager, Atlanta, Ga., district, Remington Arms Co. Inc. Formerly assistant sales manager for Remington's Minneapolis district, Mr. Mitchell succeeds Frank E. Morancy, resigned.

♦

Herbert L. Luria, Luria Bros. & Co. Inc., Philadelphia, has been appointed chairman and Arthur M. Price, Price-Watson Co., Chicago, vice chairman, railroad scrap committee, Institute of Scrap Iron and Steel Inc., New York.

♦

N. J. Clarke, vice president in charge of sales, and C. M. White, vice president in charge of operations, Republic Steel Corp., Cleveland, were elected directors of the corporation at the annual stockholders meeting in Jersey City, N. J., April 12.

♦

Francis H. Brownell, chairman, American Smelting & Refining Co., New York, has been elected chairman, General Cable Corp., succeeding Walter Robbins, resigned. F. M. Potter, vice president, has been elevated to the newly created post of vice chairman.

♦

Henry W. Erickson, engineer in the crushing, cement and mining division of Allis-Chalmers Mfg. Co., Milwaukee, has been transferred to the El Paso, Tex., district office where he will specialize on mining machinery. He has been with Allis-Chalmers since 1929.

♦

Frank E. Ward will move from Buffalo to Rockford, Ill., May 1, where he will be sales representative for the American Steel & Wire Co. Previous to his return to Buffalo about a year ago, Mr. Ward was the company's sales representative in Peoria and Springfield, Ill.

♦

Edward J. Engel, executive vice president, has been elected president, Atchison, Topeka & Santa Fe Railway Co. He succeeds the late Samuel T. Bledsoe. Mr. Engel joined Santa Fe in 1899 as a stenographer in the purchasing department.

♦

C. R. Stephens, affiliated with the Wickwire Spencer Steel Co., New York, the past 19 years, has been appointed acting district manager, Pacific coast district, with headquarters at 101 Townsend street, San Francisco. He succeeds the late H. A. Larsen.

♦

G. O. Rowland, associated with Osborn Mfg. Co., Cleveland, four years, the first three as sales representative in the Middle West, and the past year in the Cleveland office as manager of distributor sales, has been named advertising and sales promotion manager of Osborn's brush division.

♦

A. J. Aulerich, identified with Progressive Welder Co., Detroit, in the development of the first hydromatic welder ever built, and the past four years in company's Detroit sales and service division, has been transferred to Dayton, O., where he

will handle sales in Ohio and Indiana. His headquarters will be at 503 Callahan building.

♦

L. H. Chamberlain, district manager, Water Works Supply Co., Los Angeles, and the United States Pipe & Foundry Co., Los Angeles, since 1926, has been appointed manager, water works sales section, Crane Co., Chicago. W. A. Dallach, with many years of experience in Crane Co. engineering and sales divisions, will be Mr. Chamberlain's assistant.

♦

Alexander C. Brown, vice president, Cleveland-Cliffs Iron Co., Cleveland, and W. C. Dressler, vessel manager, Oglebay, Norton & Co., Cleveland, have been added to the board of directors, Lake Carriers association, Cleveland. Oliver T. Burnham, heretofore assistant secretary of the association, has been elected secretary, succeeding George A. Marr, who continues as treasurer.

♦

Wallace G. Smith, formerly with Baldwin Locomotive Works, Philadelphia, and the Cramp Brass & Iron Foundries Co., is now employed as sales representative with the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

♦

Prof. Harry D. Churchill of Case School of Applied Science, Cleveland, has been elected chairman, Cleveland chapter, American Society for Metals. Other officers elected are: Vice chairman, Louis W. Kempf, Aluminum Co. of America; treasurer, Lewis F. Herron, James H. Herron Co.; secretary, George J. Hales, Cleveland Electric Illuminating Co.

♦

R. W. Sanborn, formerly district manager of mechanical goods sales at Pittsburgh, Goodyear Tire & Rubber Co., Akron, O., has become manager of all hose sales, with headquarters in Akron. W. T. Bell, manager, hose department, has been placed in charge of distributor sales, a new department. C. A. Mathias, mechanical goods salesman at Buffalo, has been promoted to district manager of mechanical goods at Pittsburgh. R. W. Richardson, mechanical goods salesman in the Chicago territory, has been transferred to Buffalo, replacing Mr. Mathias.

♦

F. H. Cash, formerly superintendent, Susquehanna Alexandria mines, Republic Steel Corp., has been appointed general superintendent of Republic's Minnesota ore mines, with headquarters at Hibbing, Minn. W. M. Webb, heretofore superintendent of Republic's Penokee and Ironton mines, has been named general superintendent of its Michigan mines, with headquarters in Bessemer, Mich.

The division of Republic's northern ore mines into two districts follows the death of John E. Nelson, for many years manager of Republic's northern ore mines.

♦

H. C. Pletscher has been made Detroit representative of Precision Metal Workers, Chicago, a stamping firm, with headquarters at 704 Stephenson building.

♦

R. J. Knerr, since 1934 superintendent of maintenance, has been promoted to superintendent, Lehigh mills, Bethlehem plant, Bethlehem Steel Co. He succeeds Arthur C. Cusick, who will leave Bethlehem to become general superintendent, Crucible Steel Co. of America.

Other Bethlehem promotions include: L. J. Bray, general foreman, locomotive repair shop the past seven years, becomes superintendent of maintenance, Lehigh mills, succeeding Mr. Knerr; A. W. Chenoweth, assistant superintendent of Lehigh finishing mills, has been made superintendent of these mills; Henry I. Maurer, heretofore assistant superintendent, has been advanced to superintendent of the 35-inch and 18-inch mills; H. L. Gifford, formerly assistant superintendent, has been appointed superintendent, treatment and cold drawn

(*Please turn to Page* 107)

Wallace G. Smith

DIED:

■ PHILIP E. BLISS, 53, president and a director, Warner & Swasey Co., Cleveland, in that city April 11. Mr. Bliss joined Warner & Swasey in 1910 as a junior clerk in the accounting department, became successively auditor, treasurer, vice president, and in 1928, president. He was born in North Fairfield, O., and attended Ohio Wesleyan university.

Mr. Bliss was a member of the executive committee, National Industrial Conference board; member, American Society of Mechanical Engineers and the Cleveland Engineering society; past president, National Machine Tool Builders' association; trustee, Case School of Applied Science. He had been a member of the NRA compliance board in Cleveland, was a member of the Army Ordnance association, was active in educational, financial and hospital activities.

♦

Watson A. Guthrie, 57, president and treasurer, Edward Ermold Co., machinery manufacturer, New York, April 1 in that city.

♦

Frank Myers, 59, president, treasurer and general manager, Poughkeepsie Foundry & Machine Co., and secretary and a director, Standard Gage Co., both of Poughkeepsie, N. Y., in that city, recently.

♦

H. A. Larsen, 54, manager, Pacific coast district, Wickwire Spencer Steel Co., New York, in San Francisco, recently. He was associated with the company since Jan. 1, 1934, directing sales of the company's products on the Pacific coast.

♦

Edward F. Goltra, 76, president, Mississippi Valley Iron Co., which has been inactive in recent years, and a director, American Steel Foundries, Chicago, in St. Louis April 2. At one time he was president, Missouri Iron Co.

♦

Maj. Matthew J. Hoff, 50, former vice president and general manager, Great Lakes Malleable Iron Co., Milwaukee, March 30 in that city. He joined the company following service in the World war and was active until ill health caused his retirement in 1932.

♦

Col. Samuel M. Nicholson, 78, president, Nicholson File Co. and American Screw Co., Providence, R. I., in that city, April 7. He joined the company in 1879, subsequently became secretary and vice president. He was elected president and general manager in 1893, succeeding his father who held these positions prior to his death.

♦

Edward Gray, 66, formerly chief engineer, Ford Motor Co., Detroit, in Detroit, April 2. Mr. Gray designed and installed the first large internal combustion engines in the old Ford Highland Park plant. He remained with Ford eight years. The last three years he devoted his time to designing a combination steam-diesel locomotive.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ UNITED STATES leadership in the Mexican machinery market gradually is being reduced as result of the barter agreements with Germany, Italy and Japan, a commerce department survey discloses.

In 1937, Mexican machinery imports totaled 78 million pesos, of which the United States supplied 57 million pesos and Germany 12 million pesos, or 74 per cent and 15 per cent respectively. For the first six months of 1938, total Mexican machinery imports were valued at 27 million pesos, of which the United States supplied 17 million pesos and Germany seven million pesos, or 63 per cent and 25 per cent respectively. A further reduction in the shipments of machinery is anticipated this year.

German participation in the Mexican machinery market is steadily increasing, especially in purchases by the Mexican government. In the petroleum field the government, finding it difficult to sell oil for cash in the world markets, is engaging in barter deals with Germany, Italy and Japan.

While only small amounts of German equipment have entered Mexico on the barter basis at this date, large quantities of German machinery including trucks, broadcasting equipment, machinery for highway construction, rails, pipe, compressors, rubber hose, diesel engines, power generating and transmitting equipment, and bridge steel are understood to be on order for future delivery.

Reached Peak in 1937

In former years Mexico took about 6 per cent of all United States machinery exports. Chief user has been the Mexican mining industry.

Shipments of machinery to Mexico reached a new high in 1937 due to the stimulus offered by purchases for irrigation, railway and highway projects sponsored by the Mexican government. The government program was severely curtailed near the close of 1937, however, resulting in a decline in American machinery exports to Mexico during 1938.

Expropriation of the privately owned oil properties in March, 1938, resulted in a withdrawal of capital from Mexico and for a period caused practically all Mexican industries to retrench rather than to go forward. The Mexican government, since that date, has purchased practically no oil refinery equipment, all of which formerly came from the United States.

German participation in the export machinery trade to Mexico is most sharply felt in the textile field. Importation of textile machinery from the United States dropped sharply while Germany increased her trade with Mexico and is shipping large numbers of textile winder machines.

Germans Liberal with Credit

One factor in increased German trade with Mexico, besides the barter program, is the low price of German goods. In some cases German prices are from 30 to 40 per cent below those of competing United States equipment. German credit terms have also been unusually liberal, extending from one to one and a half years with little, if any, down payment.

To date Germany has had no particular success in competing with United States shoemaking machinery and practically all Mexican shoe machinery and equipment still is purchased in this country, although a few German stitching machines have been imported. One reason advanced for the failure of Germany to compete in the shoe equipment trade is the lack of durability of the German-made machinery.

United States exports of lumber machinery to Mexico have decreased from $100,000 annually in normal times to from $30,000 to $35,000 per year.

Because of the economies effected by the Mexican government during 1938, American exports of railway equipment dropped sharply. The government owned Mexican railroads purchased only necessities. Purchases of machinery for irrigation purposes were also curtailed in 1938.

"DON'T MUTILATE LABOR ACT" PLEADS SENATOR WAGNER

Senator Wagner, New York, author of the national labor relations act, appeared last week as first witness before the senate education and labor committee hearing on proposed amendments.

Following the senator's testimony, the committee adjourned until Monday, April 17. During the week of April 17 it is expected various members of congress, both for and against amendments, will appear. Many other groups will be heard. Indications are the hearings will drag along for four or five weeks, and there is a charge of "stalling" by those who favor amendments.

Senator Wagner told the committee the proof is overwhelming that the labor act in its broad outline "has proved an effective instrument for economic peace and industrial justice." He contended the act has benefited workers and employers and the public at large. "No one," said Senator Wagner, "challenges its objectives; no responsible party openly advocates its repeal. Any diminution of its effectiveness would be a national evil; its mutilation would be a national calamity . . .

"The amendments pretending to make the act 'fair' by placing new restraints on labor would in true effect upset labor's new equality of bargaining power, and resign labor to its earlier status of the economic underling."

CIO last week charged AFL

SUBTRACT and you ADD WITH THE

Speed Nut System (PATENTED)

SUBTRACT— NUMBER OF PARTS HANDLED *and you* **+ADD** SAVING

SUBTRACT— VIBRATION LOOSENING *and you* **+ADD** TO QUALITY OF PRODUCT

SUBTRACT— PRODUCT DAMAGE FROM FAULTY FASTENINGS *and you* **+ADD** DEFINITE COST SAVINGS

SUBTRACT— ½ YOUR ASSEMBLY COST *and you* **+ADD** THAT TO PROFIT SIDE OF LEDGER

NEW SPEED NUT WAY

OLD WAY

SPEED NUTS are manufactured from high carbon spring steel to provide positive holding power for the life of the product. Made for most standard sizes of machine screws, stove bolts, metal screws, metal rivets and plastic studs. Many special shapes and sizes also developed for mass production products. Write today for samples, stating sizes you want and where you expect to use them.

SPEED NUT DIVISION TINNERMAN STOVE & RANGE CO.
2039 FULTON ROAD, CLEVELAND, OHIO
Manufacturers of Patented SPEED NUTS

President Green with entering into a "definite conspiracy" with the National Association of Manufacturers and the United States chamber of commerce to break the Wagner act.

"Examination of the NAM proposals and those announced by the chamber of commerce shows that they are in many respects startlingly similar to the amendments advanced by Senator Walsh and sponsored by William Green and his associates," the committee said.

INDUSTRY TO TELL OWN STORY BEFORE TNEC

Temporary national economic committee last week announced a new phase of its studies which, according to Senator O'Mahoney, chairman, will enable business and industry to present its own story of the nation's economic problems. This shift in plans reportedly is being made partially, if not wholly, because of the crude way in which the federal trade commission handled the steel hearing.

Committee members and officials of the trade commission severely criticized the way the steel case was presented. It was so one-sided, in fact, that Chairman O'Mahoney declared it could not be considered to be the attitude of the economic committee toward the steel industry.

PROPOSE BARTER DEALS TO OBTAIN CRITICAL MATERIALS

Several weeks ago when the strategic minerals bill was before the senate, Senator Lodge, Massachusetts Republican, offered an amendment by which this country would accept strategic minerals from foreign countries on credit against war debts. The amendment had no chance of adoption.

However, last week Senator Byrnes, South Carolina, apparently with the sanction of the administration, suggested the state department undertake to find out whether certain other governments would be willing to enter into an exchange of raw materials reciprocally desired for emergency stock purposes and for such purposes only.

The state department said from the American point of view it would be useful for our government to acquire for a long-term storage reserve stocks of certain materials not produced within the United States or produced only in limited quantities. Various executive departments, the state department points out, have strongly indicated this policy in their support of the several bills now before congress for acquiring such reserve stocks by purchase.

The state department said: "It is our sincere hope that this legislation will be passed.

"The appropriations available under such legislation, however, will not be sufficient to make possible the acquisition of adequate supplies. Therefore, if it proves to be possible to secure some of these supplies by direct exchange for some of our surplus wheat and cotton which other governments might wish to store for emergencies, such interchange ought to be mutually beneficial. Such arrangements would fall completely outside of the sphere of ordinary commercial interchange and would not affect the sphere of operation of the trade agreements program or any of our other general policies."

WHEELER-TRUMAN BILL OPPOSED BY INDUSTRY

The steel industry has shown considerable interest in S2009, the Wheeler-Truman bill, a provision of which prohibits a carrier from transporting commodities owned by its parent company. Such a prohibition would affect railroads owned by industries, pipe lines and some water carriers.

It is reported it was the intent of the bill's authors to make the clause apply to such roads as the Elgin, Joliet & Eastern, an affiliate of the United States Steel Corp., which the Supreme Court held was not subject to the present commodities clause. Senator Wheeler said he was "very doubtful whether anything so drastic should be included in the bill."

PUBLIC CONTRACTS BUREAU RE-DEFINES "DEALER"

Bureau of public contracts has amended its definition of "dealer":

"A regular dealer is a person who owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and sold to the public in the usual course of business."

Bureau defines a machine tool dealer as follows:

"A machine tool dealer may be a person possessing, through contract or agreement with a manufacturer, the responsibility for selling that manufacturer's products, with respect to a specific territory and who is authorized by such manufacturer to offer its products and to negotiate and conclude contracts for the furnishing thereof; provided, that upon all orders to manufacturers for direct shipment to the United States he agrees to insert a notice to the manufacturer to the effect that the supplies are purchased for the United States and that the manufacturer is within the terms of article 104 of these regulations requiring compliance with the provisions of the 'public contracts act'."

APPELLATE COURT RULES ON IMPORT DUTY PROTEST

Associate Judge Jackson of the United States court of customs and patent appeals ruled last week on import duty on galvanized corrugated iron sheets in the case of Otis McAllister & Co. against the United States.

Galvanized corrugated iron sheets were assessed at 75/100 of 1 cent per pound as corrugated iron sheets, plus 2/10 of 1 cent per pound for being galvanized. Importers protested they were properly dutiable at 1/5 of 1 cent per pound or at 20 per cent as structural shapes of iron or steel. The United States customs court overruled the protest and the court's judgment was affirmed by the court of appeals.

EDWARD J. NOBLE NAMED ASSISTANT TO HOPKINS

Edward J. Noble, chairman, civil aeronautics authority, has resigned to become associated with Secretary of Commerce Hopkins.

For the present, Mr. Noble will act as a dollar-a-year man, executive assistant to the secretary. However, Mr. Hopkins will ask congress to create an under-secretaryship in the commerce department similar to the position now existing in several other departments. If the new position is created, Mr. Noble will out-rank Assistant Secretaries Patterson and Johnson.

According to information now available, Mr. Noble will supervise the bureau of foreign and domestic commerce. Mr. Noble is a Republican and founded Life Savers Inc.

In addition to being the principal stockholder in Life Savers Inc. Mr. Noble has been a stockholder and director in various business corporations including Drug Inc., Union Bag and Paper Co., Commercial Bank and Trust Co., and Standards Industry Inc.

GOVERNMENT IRON, STEEL AWARDS TOTAL $327,700

During the week ended April 8, the government purchased $327,700.54 worth of iron, steel, and their products under the Walsh-Healey act as follows: Steel Improvement & Forge Co., Cleveland, $21,567.60; Midvale Co., Washington, $226,325; Diebold Safe and Lock Co., Canton, O., $14,944; Youngstown Sheet & Tube Co., Youngstown, O., $11,512.49; Carnegie-Illinois Steel Corp., Washington, $19,327.95; Hart Mfg. Co., Louisville, Ky., $20,723.50; and Protectoseal Co., Chicago, $13,300 (estimated).

AVIATION

LEADING AIRCRAFT BUILDERS SHOW 90% GAIN IN PROFITS

■ CONTRASTING with the reduced income generally experienced by industry in 1938 are the substantially higher profits reported by aircraft manufacturers. Seven leading builders, representing 80 per cent of total output, show net income aggregating $17,403,068, a 90 per cent gain over their $9,163,233 for 1937.

Sales by these seven companies last year amounted to $142,166,408, compared with $102,164,957 the preceding year.

Douglas Aircraft has awarded contract to the Austin Co. for constructing a 120 x 340-foot addition to its El Segundo, Calif., plant. Costing about $50,000, the new unit is to be equipped with tram rail and a 7½-ton crane.

Beech Aircraft Corp., Wichita, Kans., now negotiating for a site near Austin, Tex., proposes to construct a factory costing up to $1,000,000 for manufacturing planes and parts.

Mexico has concluded an agreement with Canadian Car & Foundry Co. Ltd., Montreal, whereby military airplanes will be built in Mexico. Government is to erect factory, Canadian Car to equip and operate it. Engines, propellers, instruments and raw materials are to be purchased in the United States.

Canadian Associated Aircraft Ltd., Toronto, soon will receive bids for a $350,000 extension to its plant at Malton, Ont.

Harlow Aircraft Co., Alhambra, Calif., proposes to issue $500,000 in stock for acquiring plant and assets of Harlow Engineering Corp., Los Angeles. Funds are being allotted for new equipment and metalworking machinery.

Army air corps will open bids at Wright field, Dayton, O., July 5, for light primary training craft; and July 6, for interceptor pursuit planes. Bids will be taken up to the same week on eight other types.

Recent federal orders for aeronautical equipment: Treasury department, Grumman Aircraft Engineering Corp., Bethpage, L. I., airplanes, $204,000; army, Air Cruisers Inc., Clifton, N. J., oxygen cylinder assemblies, $41,790; and navy, Breeze Corporations Inc., Newark, N. J., weather instruments, $24,050.

Ryan Aeronautical Co., San Diego, last week booked a $200,000 contract for engine parts and accessories from Lockheed Aircraft Corp. Material is needed in filling Lockheed's foreign orders.

Plan Seaplane Bases

Seaplane bases at 150-mile intervals along the Atlantic seaboard are planned by Civil Aeronautics Authority. Municipalities and National Youth Administration will co-operate in constructing standardized wood and steel floats, more than 50 of which are already scheduled for completion by midsummer.

New type of electrically-welded hollow steel propeller blade which is said to weigh 25 per cent less than standard models has been developed by Lycoming division, Aviation Mfg. Corp., Williamsport, Pa. It is fabricated from a single length of seamless chrome-nickel-molybdenum steel tubing.

Improved ignition and greater engine efficiency are claimed for a new airplane ignition cable announced by Sterling Cable division of Electric Auto-Lite Co., Port Huron, Mich. Featured is the use of seven strands of stainless steel wire.

Defines Safety's Dollar Value

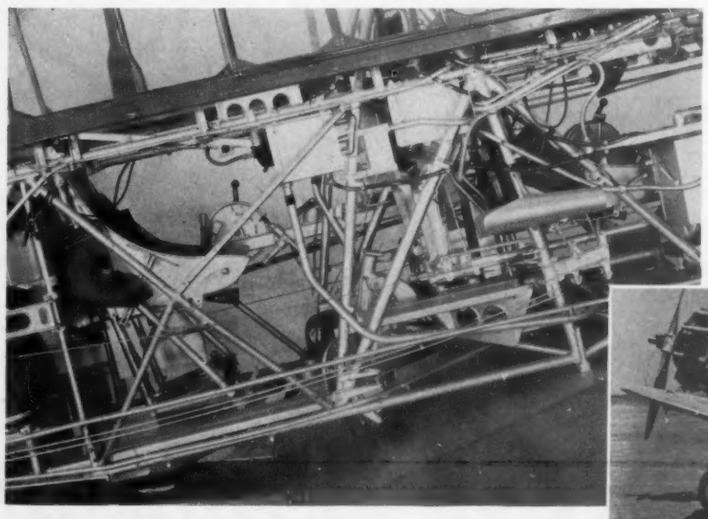
■ MONETARY as well as humanitarian benefits result from effective safety programs, Edward R. Granniss declared before the annual convention of the Greater New York Safety council in New York recently. Mr. Granniss is director of the industrial engineering division, National Conservation Bureau of the Association of Casualty and Surety Executives.

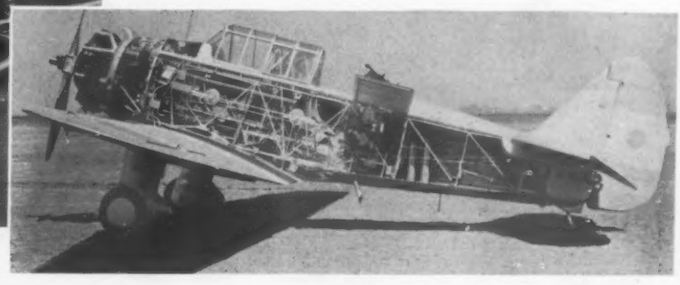
An employer actually pays four times the combined medical and compensation costs for an occupational accident, he estimated, on basis of a national study including several thousand cases.

Mr. Granniss cited the effectiveness of the United States Steel Corp.'s safety program. In 25 years, the rate of serious and fatal accidents in subsidiary companies was reduced more than 50 per cent. He estimated more than 70,000 workers have been saved from serious injury or death by the program.

"If we place a value of $5000 on each of these bad accidents, there is a monetary saving of $350,000,000," he continued. "The corporation estimates it spent some $26,000,000 since 1912 to promote safety work. Deducting $26,000,000 from $350,000,000, a saving of more than $300,000,000 is indicated."

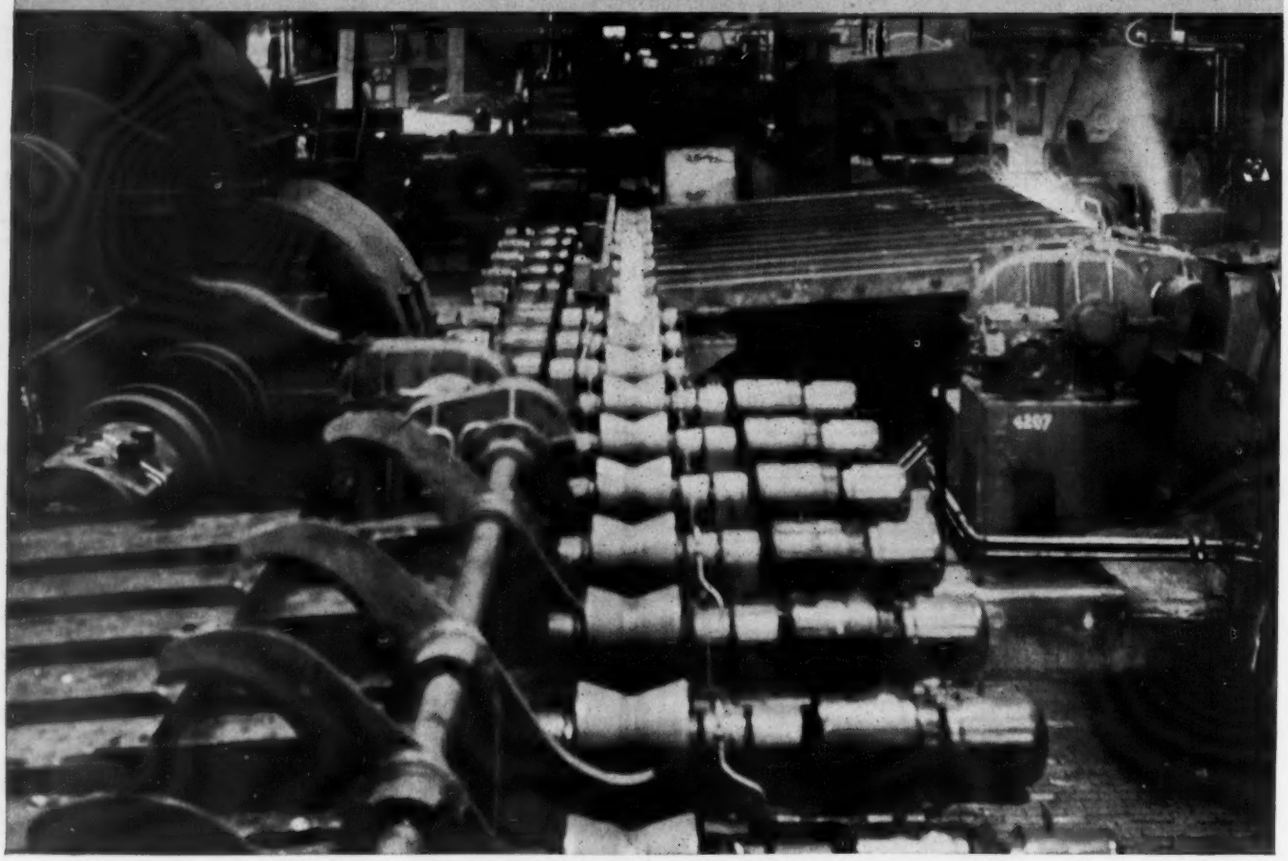
■ Ford exposition visitors at the New York World's fair will see a 160-ton press producing inner shells for automobile hub caps at a cost of 12 and a fraction cents each, while beside it a skilled workman pounding with hammers will produce the same cap by hand at a cost of at least $2.50.





■ **Stripped of its fuselage covering, this North American attack-bomber reveals the maze of metal parts comprising a modern airplane. Used in this craft are aluminum alloy shapes, and seamless chrome-molybdenum steel aircraft tubing, made by National Tube Co. View at top looks into rear cockpit from right side**

Judge Them by PAST PERFORMANCE



—and it will be Hyatts Again

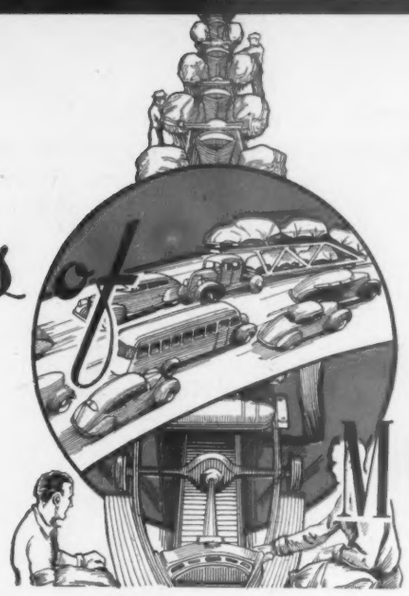
In the tables at the Youngstown Sheet and Tube Company's new seamless tube mill, as illustrated, Hyatt Roller Bearings are employed. They are likewise serving in other Youngstown units—the strip mills, cars, motors, and so on.

Past dependable performance in Youngstown equipment, we like to feel, had considerable to do with the continued use of Hyatts. Repeat order after order, in mill after mill, like this makes Hyatt a dominant bearing in steel mill service.

Where and when can we serve you? Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey; Detroit, Chicago, Pittsburgh and San Francisco.

HYATT *Roller Bearings*

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Material appearing in this department is fully protected by copyright, and its use in any form whatsoever without permission is prohibited.

DETROIT

■ PROSPECTS for spring business in many industries hinge importantly on the outlook for automobile production this month and next. Normally these two months are peak periods for the year in point of retail demand. Hence business generally is vitally concerned with the status of retail demand for cars right now.

Scattered reports would indicate retail buyers of automobiles are not flocking to salesrooms in the accustomed numbers this spring. Why?

The best place to get an answer to this question is on the firing line, from automobile salesmen whose daily bread is dependent upon their ability to persuade people to buy. Here, then, are comments from a new representative salesmen, approached at random in salesrooms in this city, some in densely populated centers and some in outlying sections. They were interrogated without previous warning and their replies came on the spur of the moment, precluding possibility of carefully prepared statements which probably would not reflect a true picture. They say:

A Cadillac-LaSalle salesman—

"People in the middle classes just aren't in a buying mood, and when the big fellows note this hesitancy they too hold back on purchases. Our new car stocks are on the low side and in some cases it takes two weeks for delivery of a car. But there has been no spring rush as yet.

"Incidentally, the automobile business is different today than it was years ago. Today people spend their money as fast as they get hold of it and when times get a little bad they have no funds. Years ago people set aside a little cash so that even in times of stress they had money with which to buy cars if the desire and need dictated.

"I don't believe the stock market collapse or the European war scare can be blamed for failure of spring business to develop."

A Chevrolet salesman—

"These days the competition for new car sales in the low-price field is terrific—you practically have to go out and buy the business. Most dealers are 'off the book' on trade-in allowances and we have to make some pretty fancy offers to close orders. Our business on the floor has dropped to practically nothing. Last month I worked seven nights and did not sell a single car.

"The sales I have been able to make resulted from telephone contacts with present Chevrolet owners. Even our transient business has disappeared. We sold a number of cars in 1937 to people just passing through enroute from California; this year we haven't seen any customers of this type.

"I think prospective customers have the money to spend, but they are just sitting tight at present.

"One factor which we do find hurts car sales is the widespread building of homes by people in moderate circumstances. Making the down payment on property and meeting monthly payments means many must postpone buying a car."

A Ford salesman—

"The public isn't buying cars this spring; it has to be sold. And that's

Suggests the Power of Suggestion

■ "WHEN I was 19, my brother *suggested* we form a partnership to sell tires and accessories. When we needed more space the auto dealer who occupied the space we wanted *suggested* we buy the agency and his lease.

"Then my distributor closed up and a friend *suggested* I come to West Texas where a distributorship was open. The manufacturer shipped me a lot of extra cars without any *suggestion* how I could sell them, so I was well-loaded when the cotton crop failed.

"New models were announced and the factory *suggested* I take an extra carload of old models with each carload of new ones. When I declined they *suggested* I retire, as they had found an old farmer who had sold his land and wanted his son to be a big business man.

"A new oil field opened nearby, so my brother *suggested* I start anew as a dealer with a better manufacturer. The boom was on and I sold a lot of cars and trucks. Then my wife *suggested* I buy out the leading agency.

"I became the biggest dealer in the oil field, and at the *suggestion* of the factory I put my profits back in the business. The oil boom collapsed.

"The factory diverted a lot of cars from the railroad tracks to me, and I *suggested* they keep them. They *suggested* I take them —or else. I elsed.

"After two years of *suggestions* by practically all auto manufacturers, I decided to try it again as a multiple dealer. Within 18 months the manufacturer *suggested* I become the biggest dealer in town. I *suggested* more time was needed; they *suggested* more registrations, and I retired again.

"Recently in Detroit a friend *suggested* I take advantage of the upswing in the automobile business, and I *suggested* he go straight to hell."—Letter to *N.A.D.A. Bulletin*

a tough battle in many cases. Furthermore, I believe prices are too high. A man cannot comfortably pay out $235 for a down payment and then meet 18 monthly payments of $35 if he is only working two or three days a week and is not sure how long that will continue. But if you offer such a man a cheaper car, even though he could pay for it he doesn't want it because it necessarily must be substandard in appearance and accessories. Our deluxe models are far outselling standard models, which indicates buyers with standard pocketbooks want deluxe cars—and it just can't be done.

"Personally my April business has exceeded my March business for the same period, but I have been lucky this month and had a poor couple of weeks early in March. For our branch as a whole, business this month has been far below expectations."

A Buick salesman—

"I am afraid I don't know much about it. You had better talk to the sales manager over there."

A DeSoto-Plymouth dealer—

"In 1937 about 80 per cent of our business was with employes of the Chrysler Corp. Right now less than 10 per cent of our sales are to this class of buyer. We have had to write off factory workers as prospects for the time being and concentrate in other fields. I believe people generally are being frightened by newspaper headlines about the European situation and the stock market. We also notice that every time some development in Washington occurs which is favorable to business, our inquiries pick up surprisingly. Then in a day or so some decision will be made down there which can be construed as hurting business and our friends stop coming in to look at cars.

"We don't know what to expect the rest of this month and next. Right now our sales are not showing much improvement over March, but of course they are a lot better than last year at this time. I think a week or two of warm spring weather could do a lot toward bringing buyers out of their shells."

A Pontiac salesman—

"Everywhere you turn you see people scanning the newspaper headlines to find out what is happening in Europe and how far stocks have dropped in price. Even though they know these matters may not concern them directly, nevertheless they are scared out of spending their money by disturbing headlines in newspapers.

Normally in the spring over 60 per cent of our business is from buyers who just drop in while passing our store and are not contacted first by salesmen. But so far this year, there has been almost no business of this sort. I am convinced people have the money to buy; they are just being scared into sitting tight.

"Of course the weather so far has been terrible for new car sales, and we hope that in the next few weeks warmer weather will bring out a flock of buyers."

Summarizing these heterogeneous and perhaps hasty opinions, the following appear to be reasons why new car sales are not showing the hoped-for zip:

Fear engendered by news reports from Europe.
Lack of support from the factory-worker class of buyer.
Adverse spring weather.
Competitive situation on trade-ins.
High prices.

■ THIS week the nation's auto dealers will convene in San Francisco and attempt officially to find out what is wrong with business conditions. It is to be hoped they will be successful, especially when consideration is given to a recent analysis prepared by the dealers' association which shows that 160 representative dealers in 1938 made an average operating profit of only 76 cents per new car sale, and an overall net profit of but $4.25 per new car sale or 0.21 per cent on total sales of better than $50,000,000. The report shows this group of dealers did 73.8 per cent as much business in volume of sales in 1938 as in 1937, and realized only 11.23 per cent as much net profit. A marked increase in ratio of used cars sold per new car unit was shown—2.28 compared to 1.82 in 1937. This partly explains the inordinate drop in operating profit compared with gross sales.

As far as automobile producers are concerned, the brightest spot appears to be at Dodge where April parts releases have been jumped 9800 units, and a similar increase effected in May schedules. Elsewhere the trend is fairly static.

Packard, with M. M. Gilman now at the helm, succeeding Alvan Macauley who has resigned to become chairman of the board, is planning about 12 days total production this month, to be followed by an estimated six-week shutdown pending transfer of a large amount of machining and other equipment from buildings on the south side of East Grand boulevard to the plant on the north side.

March retail sales for the two leaders in the low-price field were 88,836 units for Chevrolet and 75,345 for Ford, increases of 41.2 and 56 per cent, respectively, over March a year ago. The Ford figures include Mercury sales which totaled 7079 units, largest monthly movement since the car was introduced last November. These sales figures compare with estimated factory output of 90,000 for Chevrolet and 82,300 for Ford-Mercury.

Automobile Manufacturers' association estimates March factory sales of cars and trucks at 389,700 units, compared with 312,227 in February.

■ INDUSTRIAL pep session was held in this city last week under direction of the board of commerce, an event designed to fulfill the dual purpose of reaffirming industrial Detroit's faith in the future and replenishing the ranks of board members. Adopting the slogan, "Nothing Stops Detroit," the city's industries set up displays in downtown areas, contrasting present products with those made ten years ago. Climax was an industrial progress dinner at which Fred M. Zeder of Chrysler Corp. and C. F. Kettering of General Motors Research were featured speakers, before an audience of about 800.

In characteristic vein, Mr. Kettering observed: "When we look backward, everything is very clear. Looking forward all is foggy. But of one thing we may be certain—that we are on the verge of the greatest industrial renaissance the world has ever known, and all we need do is to go ahead in the solid faith that some of the new things being uncovered by research science will some day be of inestimable value to the world. How or when the value will appear should not worry us."

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	312,141
March	519,022	238,598	.....
April	553,231	238,133	.....
May	540,377	210,183	.....
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
March 18	86,725	57,555
March 25	89,400	56,800
April 1	85,980	57,500
April 8	87,019	60,975
April 15	88,050	62,021

†Comparable week.

	Week Ended April 15	Week Ended April 8
General Motors	34,680	32,735
Chrysler	20,725	20,525
Ford	22,230	22,230
All others	10,415	11,529

THE FEWER, THE BETTER

The demand of the times for more production per dollar, without sacrifice in quality, brings into sharper and sharper focus the necessity for the use of the most modern materials. It is natural that the more different steels specified in machine construction, the greater the fabrication and stock room complications.

To reduce these complications, many manufacturers are taking advantage of the versatility of Molybdenum Steels. One, a builder of a varied line of heavy duty machines, replaced four different alloy steels with Chromium-Molybdenum Steel (SAE 4140) for everything from heavy crank shafts to small screw machine parts.

Overhauling your own material specifications may disclose similar opportunities for highly profitable standardization on a versatile Molybdenum steel. To assist you we will gladly send our technical book "Molybdenum in Steel", free upon request.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

Climax Mo-lyb-den-um Company
500 Fifth Avenue · New York City

MOLY

Activities of Steel Users, Makers

■ REPUBLIC STEEL CORP.'S Ideal Foundry Co., Beaver Falls, Pa., will be moved to Newton Falls, O., where it will occupy about 60,000 square feet in the old Newton Steel plant, and employ about 100 men.

Republic acquired Ideal Foundry in the merger of 1930. Fire in the Beaver Falls plant hastened decision to move. The Newton plant has excellent facilities, railroad sidings and cranes. Transfer will take several months, without interrupting operations.

♦

Keystone Steel & Wire Co., Peoria, Ill., which this year is observing the fiftieth anniversary of its founding by Peter Sommer at Tremont, Ill., has established a new warehouse at Oakland, Calif. It will be a central distribution point for the company's other West coast warehouses at Los Angeles, Seattle, and Portland, Oreg., with Carl E. Simon, West coast manager, in charge.

♦

Bjerre Machine & Accessory Co., 920 West Washington boulevard, Chicago, has been organized by Folmar Bjerre, formerly associated with J. N. Fauver Co., Detroit, to handle specialized industrial fabricating machinery and accessories.

♦

Orders received by Trane Co., La Crosse, Wis., maker of air conditioning equipment, in first quarter this year were the second largest in its history, amounting to $1,226,156, or 42 per cent more than in the first quarter of 1938.

♦

Andrews Steel Co. Newport, Ky., has awarded to J. & F. Harig Co., Cincinnati, contract for excavation, piling, reinforced concrete and structural steelwork for a building, 90 x 125 feet, to be constructed at Newport for the new bar mill.

♦

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed the following representatives: Quinn R. Barton Inc., 1305 West Forsyth street, Jacksonville, Fla.; Fuchs Machinery & Supply Co., 1102 Farnam street, Omaha, Nebr.; Great Lakes Supply Corp., 324 West Thirty-sixth street, Chicago.

♦

McKay Co., Pittsburgh, maker of tire and commercial chains, and arc welding electrodes, has transferred its general sales, order, invoicing and purchasing departments from Pittsburgh to its York, Pa., factory. Executive departments and officials and a district sales office will remain in the McKay building, Pittsburgh.

♦

Harnischfeger Corp., Milwaukee, has moved its Detroit district offices to new quarters at 845-46 Book building.

♦

Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., has been licensed to produce Ledloy, lead-bearing steel developed by Inland Steel Co.

♦

Mullins Mfg. Corp.'s pressed steel division at Youngstown, O., has business on hand necessitating 24-hour operations. As result of an improvement program undertaken to meet production requirements of a contract with Sears, Roebuck & Co., the company has widened its range of products and lowered costs.

♦

Vascoloy-Ramet Corp., North Chicago, Ill., has started operations in its new plant, 415 Tonnelle avenue, Jersey City, N. J., for production of tantalum carbide wire, tube, sectional and shape dies, cutting tools and blanks. Operations are in charge of John Kontra, Joseph Hall and John Adler, formerly with Union Wire Die Co. District sales and service are handled by Hayden G. Fulton, formerly at the North Chicago plant.

♦

Six slide gate valves of special bronze alloy to resist the corrosive effect of polluted water in the new Mahoning flood control dam above Pittsburgh, are to be fabricated by Koppers Co. at its Bartlett Hayward division, Baltimore. Each gate will be 10 feet by 5 feet, 8 inches. Contract has been awarded by war department's Pittsburgh district engineers.

MEETINGS

BRITISH STEEL INSTITUTE TO CONVENE IN LONDON

■ BRITISH Iron and Steel institute will conduct its annual meeting at the Institution of Civil Engineers, London, May 3-5. Features will include presentation of the Bessemer gold medal for 1939 to James Henderson, and announcements concerning other awards, including the Andrew Carnegie gold medal for 1938, and the Williams prize for 1938. Many technical papers and reports will be read. The institute's autumn meeting will be held in Great Britain, probably Sept. 12-16.

OHIO CHAPTERS OF A.S.M. MEETING IN CINCINNATI

Series of lectures and discussions on "Unusual Surface Hardening" will feature the annual meeting of Columbus, Dayton and Cincinnati chapters, American Society for Metals, Alms hotel, Cincinnati, April 20. The Ohio Valley section, American Institute of Mining and Metallurgical Engineers, will participate.

Papers scheduled: "Flame Hardening," by Stephen Smith, Air Reduction Sales Co., New York; "Hard Facing Alloys and Their Application," by R. L. Lerch, Haynes Stellite Co., Kokomo, Ind.; "Silicon Impregnation," by Harry K. Ihrig, Globe Steel Tubes Co., Milwaukee.

STEEL ENGINEERS TO VISIT PLANTS IN YOUNGSTOWN

Cleveland and Pittsburgh sections, Association of Iron and Steel Engineers, will hold a joint meeting at the Ohio hotel, Youngstown, O., May 2. Forenoon will be spent visiting Youngstown Sheet & Tube Co.'s Brier Hill plant. Lunch will be served at the hotel and in the afternoon the engineers will visit the company's new seamless tube mill at the Campbell works.

Two papers will be presented at the dinner meeting in the evening: "Development and Latest Design of Seamless Tube Mills," by Carl Olson, general manager, Aetna-Standard Engineering Co., Youngstown; and "Application of Antifriction Bearings to Seamless Tube Mills," by S. M. Weckstein, Timken Roller Bearing Co., Canton, O.

COOLIDGE TO GET FARADAY MEDAL AT A.I.E.E. MEETING

A feature of the Northeastern district meeting of the American Institute of Electrical Engineers at Hotel Kimball, Springfield, Mass., May 3-5, will be the presentation of the Faraday medal for 1938 to Dr. W. D. Coolidge, director of the research laboratory, General Electric Co., Schenectady, N. Y. This medal is awarded each year by the Institution of Electrical Engineers of Great Britain for notable scientific and industrial achievement in electrical engineering.

Among papers scheduled for convention sessions is "Electrical Equipment on Machine Tools," by B. P. Graves, Brown & Sharpe Mfg. Co., Providence, R. I.

Shipbuilding Promises Continued Activity

■ Ships under construction to its classification April 1 represented smaller tonnage than on March 1, but substantially above a year ago, according to a report by American bureau of shipping, New York.

Vessels building April 1 numbered 165, or 678,750 gross tons,

against 180, or 697,110 tons March 1, and 105, at 389,275 tons, April 1, 1938. The April total includes 73 seagoing craft, 634,350 tons. During March 13 vessels, 4550 tons, were added.

Considerable new work is expected to come out for bids within the next few weeks. United States maritime commission plans to award contracts in June for about 12 C-1 cargo vessels of 8000 gross tons each. A number of high-speed tankers are under consideration and eight navy vessels are to be bid about May 24. Maritime commission is expected to ask bids before fall on three high-speed passenger liners for Oriental service. Little important ship work has been figured recently except the aircraft carrier on which Newport News Shipbuilding & Dry Dock Co. was the only bidder.

Wisconsin Prohibits "Stranger" Picketing

■ Governor Julius P. Heil, Wisconsin, has signed a bill defining labor disputes, limiting the term to actual disagreements between employer and employes resulting in a strike or lockout. The purpose is to enable procurement of an injunction against picketing by organizations seeking to force employes into union ranks, so-called "stranger picketing." The new definition of a labor dispute is, "only as between an employer or association of employers and two or more of their employes or their representatives; and no labor disputes shall be deemed to exist unless the controversy results in a strike or lockout."

Steel Corp. Shipments 42.8 Per Cent Over '38

■ United States Steel Corp.'s finished steel shipments in March totaled 767,910 tons, or 89,916 tons, 13.26 per cent, over February, and 195,711 tons, 34 per cent, over March, 1938. Three months shipments were 2,235,209 tons, compared with 1,565,244 tons in first quarter, 1938, an increase of 42.8 per cent.

(Inter-company shipments not included)

(Tons)

	1939	1938	1937	1936
Jan.	789,305	518,322	1,149,918	721,414
Feb.	677,994	474,723	1,133,724	676,315
March	767,910	572,199	1,414,399	783,552
April	.....	501,972	1,343,644	979,907
May	.....	465,081	1,304,039	984,097
June	.....	478,057	1,268,550	886,065
July	.....	441,570	1,186,752	950,851
Aug.	.....	558,634	1,107,858	923,703
Sept.	.....	577,666	1,047,962	961,803
Oct.	.....	663,287	792,310	1,007,417
Nov.	.....	679,653	587,241	882,643
Dec.	.....	694,204	489,070	1,067,365
Adj.*	.....	‡30,381	†77,113	†40,859
Total	.....	6,655,749	12,748,354	10,784,273

*Yearly adjustment. †Deduction. ‡Increase.

Huge Cast-Iron Vulcan Overlooks Birmingham

■ This statue of Vulcan, Roman god of fire and metalworking, has been erected on Red Mountain, overlooking Birmingham, Ala. It is 55 feet high, weighs 100 tons, surmounts a tower 124 feet high, giving it an elevation of nearly 600 feet above the city.

Reported to be the second largest statue in America and the world's largest cast iron figure, Vulcan has had an eventful history. Designed by G. Moretti, an Italian sculptor, it was cast in Birmingham from iron made from local ore by Sloss furnace, now part of the Sloss-Sheffield Steel & Iron Co. plant. Birmingham Commercial club sponsored the project as an exhibit at the St. Louis Louisiana Purchase exposition in 1903. Neglected for several years after its return, it finally was erected in Fair park, site of Alabama's State fair.

In 1935 Thomas N. Joy, an Alabama engineer, and the late J. Mercer Barnett, past president, Kiwanis International, proposed that the club place Vulcan on the mountain top.

May 9-17 has been set for dedication ceremonies.

Ohio Society Honors Steelmen

■ T. M. GIRDLER, chairman, Republic Steel Corp., Cleveland, appealed to business and industry to support amendments to the Wagner act to make it a law beneficial to all who work, at the fifty-fourth annual dinner of the Ohio Society of New York, in New York last week.

If such changes are made, he expressed confidence "the industrialists and the so-called economic royalists won't have any fault to find with it."

Mr. Girdler spoke at a dinner dedicated to the honor of Ohioans in the steel industry, with approximately 300 present. Others at the speakers' table included William A. Irvin, former president, United States Steel Corp. and now a member of its finance committee, and a director, and William Haig Ramage, president, Valley Mould & Iron Corp., Hubbard, O.

Sees Anti-New Deal Trend

Many prominent in the steel industry were present. Others, unable to attend, sent greetings, including Benjamin F. Fairless, president, United States Steel Corp.

Wendell L. Willkie, president, Commonwealth & Southern Corp. and a former head of the society, paid warm tribute to "the great industrialists of America, the Girdlers, the Irvins" for building the country. "Politicians didn't build America, and they won't rebuild it, for their influence is but a passing phase."

He noted a swing in sentiment against many present policies of the Washington administration. "If we are patient," he added, "we will see the time when men like Girdler are recognized as the true heroes of America."

Mr. Girdler, who had come to the meeting from Washington, referred to a statement by Senator Robert F. Wagner, New York, author of the national labor relations act, at hearings in the capital earlier in the day, that "emasculation of the act would be a national calamity."

"I don't know just what he meant by 'emasculation,'" Mr. Girdler said, "but if you have to make a bad law into a good law by "emasculating' it, then you had better 'emasculate' it.

"I ask you gentlemen of the Ohio society to see if you can't put forth a little bit of effort now during these hearings in Washington to have it amended into a good law for the benefit of all the people who work."

Editorial

Sticking Necks Out

■ AS a rule stockholders who do not receive dividends proportionate to their industrial investments suffer in silence, for they generally understand the factors which prevent many managements from making a fair profit. Therefore the sweeping character of a complaint by a stockholder at the recent annual meeting of United States Steel Corp. (STEEL of April 10, Page 32) partook of the unusual.

"Collective bargaining for stockholders as well as steelworkers." That was the slogan he sounded. Pointing out that owners of the property as represented by common stock have received only $1 in dividends during the past seven years, while at the same time huge taxes and other charges have been paid, he classed stockholders as "forgotten men and women."

He warned that unless a way is found for taking care of stockholders' interests "better and more often" there "will be no good jobs for you fellows and certainly no more capital made available for investment." In particular, he suggested that stockholders' views about various types of legislation affecting business and management be recorded at annual meetings.

Stockholder Pressure Is Wholesome Factor for Better Business

J. Newcomb Blackman, the stockholder who expressed these sentiments, is vice president of the American Federation of Investors. The question naturally arises: Is this the start of a wave of protest from stockholders in general over a condition in which those who furnish capital that enables industry to pay huge taxes to government and high unit wage rates to labor receive little consideration for this service?

It is to be hoped that this is the case. For in too many instances management is failing to develop a positive plan of action aimed at educating political officeholders and the general public as to the sort of encouragement to business that is absolutely necessary in order to have a return of real prosperity in this country.

In fact, management has a phrase to describe this attitude. Many executitves explain their failure to fight for business rights by saying that they do not wish to "stick out their necks."

More pressure from stockholders w be a wholesome thing for business because it would force management out of its present passive attitude, which is a combination of wishful thinking and, at the same time, a continued willingness to lead with the chin.

STEEL's recent survey (STEEL of April 3, Page 15) indicates that the typical, average American industrial company would expend $83,696 on plant improvements at this time were it not for government policies and political uncertainties that further becloud the outlook for profits on industrial investments.

Educational Program for Public And Legislators Is Prime Need

While a large share of the public now is arrayed against much of the government's "reform" measures of recent years, there still is not the faintest indication of any general understanding as to what is required to make business "go" in order that a job may be provided for everyone able and willing to work, and in order that the march of progress toward a higher standard of living for the average citizen may be resumed.

Management in the past has met and overcome many difficult problems. This new problem, of educating the public and political officeholders as to how more jobs can be provided, is distinctly one for industrial management. And executives who fail to meet the issue by refraining from "sticking their necks out" are in danger, eventually, of having no necks to stick out.

The BUSINESS TREND

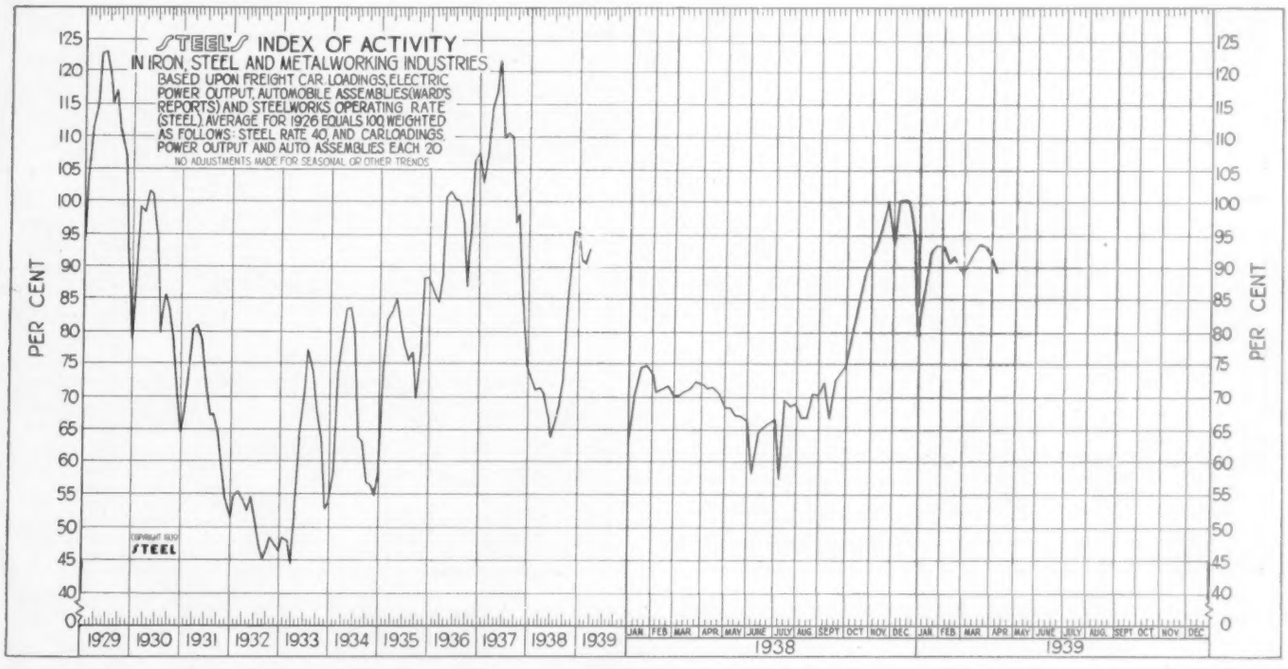
Outlook for Second Quarter Clouded by War Scares

■ THE upturn in business activity formerly expected to develop in April has doubtless been postponed for some weeks. Depressed business sentiment and the slump in security prices, resulting from the tense European situation, are working against an early reversal of the current downward tendency of most industrial indicators. However, there are sound indications that pessimism has been overdone. The inventory situation and building construction are both much better than they were a year ago, while within the last two weeks retail car sales have developed a firmer tone.

Reflecting losses in three of the four business indicators from which it is composed, STEEL's index eased 2.2 points to 90.0 in the week ended April 8. This represents the third consecutive weekly decline, but the index still remains substantially above the 71.3 recorded in the comparable week last year. The current level of the index is 10.7 points below the 1938 peak of 100.7 recorded during the week ended Dec. 10.

The national steel rate has slipped one point for the third consecutive week, to 53.5 per cent in the week ended April 8. The current rate of steelmaking operations has reverted to the level of the first week in February. Recent downward tendency of the steel rate, after several weeks of stability, is significant in that it confirms earlier signs of a falling off in new business. To date this year steelworks operations have fluctuated within the narrow range of 51.5 and 56.5 per cent.

The lone business barometer composing STEEL's index to record a gain during the week ended April 8 was


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100 WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 0
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
1939
STEEL

STEEL'S index declined 2.2 points to 90.0 per cent in the week ended April 8:

Week ending	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan. 14	91.9	74.4	106.7	89.3	73.8	58.1	48.8	56.2	72.1	91.8	104.2
Jan. 21	93.0	74.7	104.0	86.0	78.1	60.9	49.8	55.8	72.9	96.3	107.5
Jan. 28	92.9	73.8	99.6	86.5	79.5	62.3	50.8	56.2	72.9	97.4	109.8
Feb. 4	90.7	70.9	100.8	83.8	81.8	66.9	49.9	56.0	74.9	100.8	111.3
Feb. 11	92.1	71.2	101.9	85.9	82.7	70.7	48.7	55.5	75.4	100.9	111.7
Feb. 18	91.1	71.9	108.8	81.8	82.8	72.4	48.3	54.5	76.0	97.7	112.6
Feb. 25	89.3	70.3	112.8	83.4	80.5	75.5	46.0	55.1	75.8	99.7	109.2
Mar. 4	91.5	70.1	117.9	87.7	81.1	76.8	47.4	54.1	79.2	98.3	113.5
Mar. 11	92.7	70.8	112.7	89.7	82.0	78.6	43.4	54.8	80.6	97.5	114.8
Mar. 18	93.3	71.3	113.1	86.0	84.0	79.9	42.7	54.4	81.3	98.1	115.0
Mar. 25	93.2	72.4	114.0	91.2	84.0	79.7	44.6	53.5	80.6	99.6	115.0
Apr. 1	92.2	72.0	112.0	96.8	84.3	79.3	45.2	53.4	81.5	97.6	115.9
Apr. 8	90.0	71.3	112.8	99.6	83.4	79.6	49.1	52.6	80.9	102.3	119.9

automobile production. Assemblies in that week increased 1039 units to 87,019 and compare favorably with the 60,975 units produced in the corresponding week last year. Factory sales of automobiles in the United States and Canada aggregated 1,055,787 units in the first quarter, compared with 668,346 units a year ago, a gain of 56.3 per cent. Still further gains in factory sales have been reported for the first two weeks of April.

STEEL SHIPMENTS IMPROVE DURING MARCH

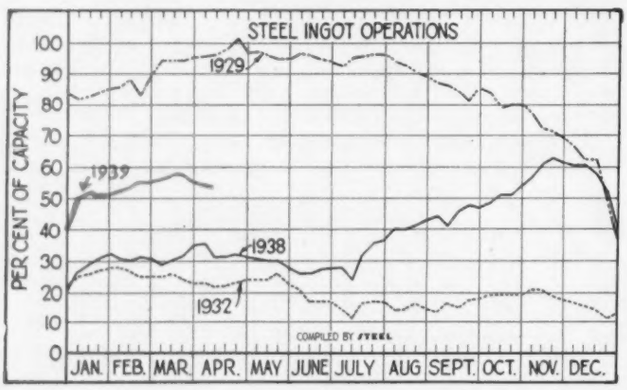
Shipments of finished steel products during March by the United States Steel Corp. recorded an encouraging gain to 767,910 tons. This compares with the February movement of 677,994 tons and represents an increase of 195,711 tons over the 572,199 tons shipped in March last year. For the first quarter shipments totaled 2,235,209 tons, against 1,565,244 tons in the same period last year. In the first three months of 1937, shipments aggregated 3,698,041 tons.

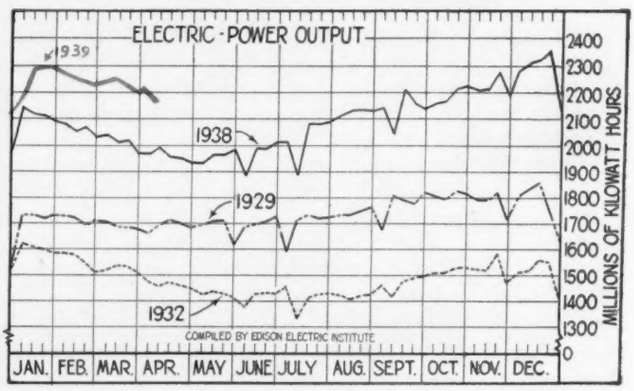
AVERAGE DAILY INGOT OUTPUT INCREASES

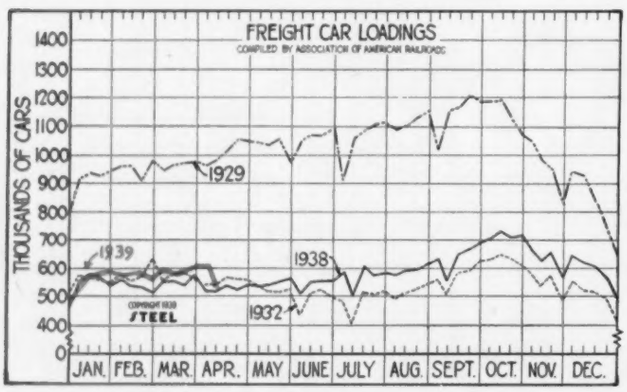
The daily average ingot production during March was 124,625 gross tons, based on the total output for the month of 3,364,877 gross tons reported by the American Iron and Steel institute. This compares with a daily average of 123,120 in February and 137,393 tons in March, 1938. Excluding November, 1938, the March daily average exceeded any month since October, 1937, of 130,497. Ingot operations last month averaged 55.63 per cent, compared with 54.10 in February and 33.85 in March, 1938. First quarter operations averaged 54.14 per cent, compared with 55.77 per cent in the fourth quarter and 31.58 per cent in the initial quarter last year. For the first three months of 1937 the national steel rate averaged 85.23 per cent.

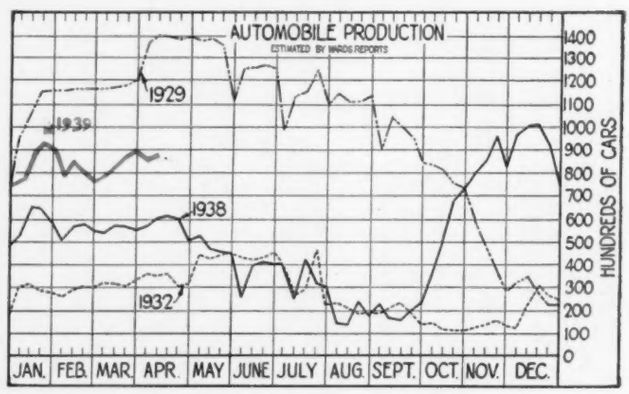
MARCH CAR AWARDS OFF SHARPLY

Domestic freight car awards during March totaled 800 cars, substantially less than the 2259 cars ordered during February but compares favorably with the January total of only three cars placed. The first quarter car awards aggregated 3062, against 814 in the corresponding period of 1938, 30,933 in the same period of 1937 and 9582 in the first three months of 1936. Department of commerce reports shipments of rail locomotives during February totaled 17 against 23 in January and 16 in February of last year. Unfilled orders for locomotives on March 1 were 116 against 91 at the end of January and 159 on March 1, 1938. Freight cars on order March 1 totaled 6788, compared with 6637 Feb. 1.

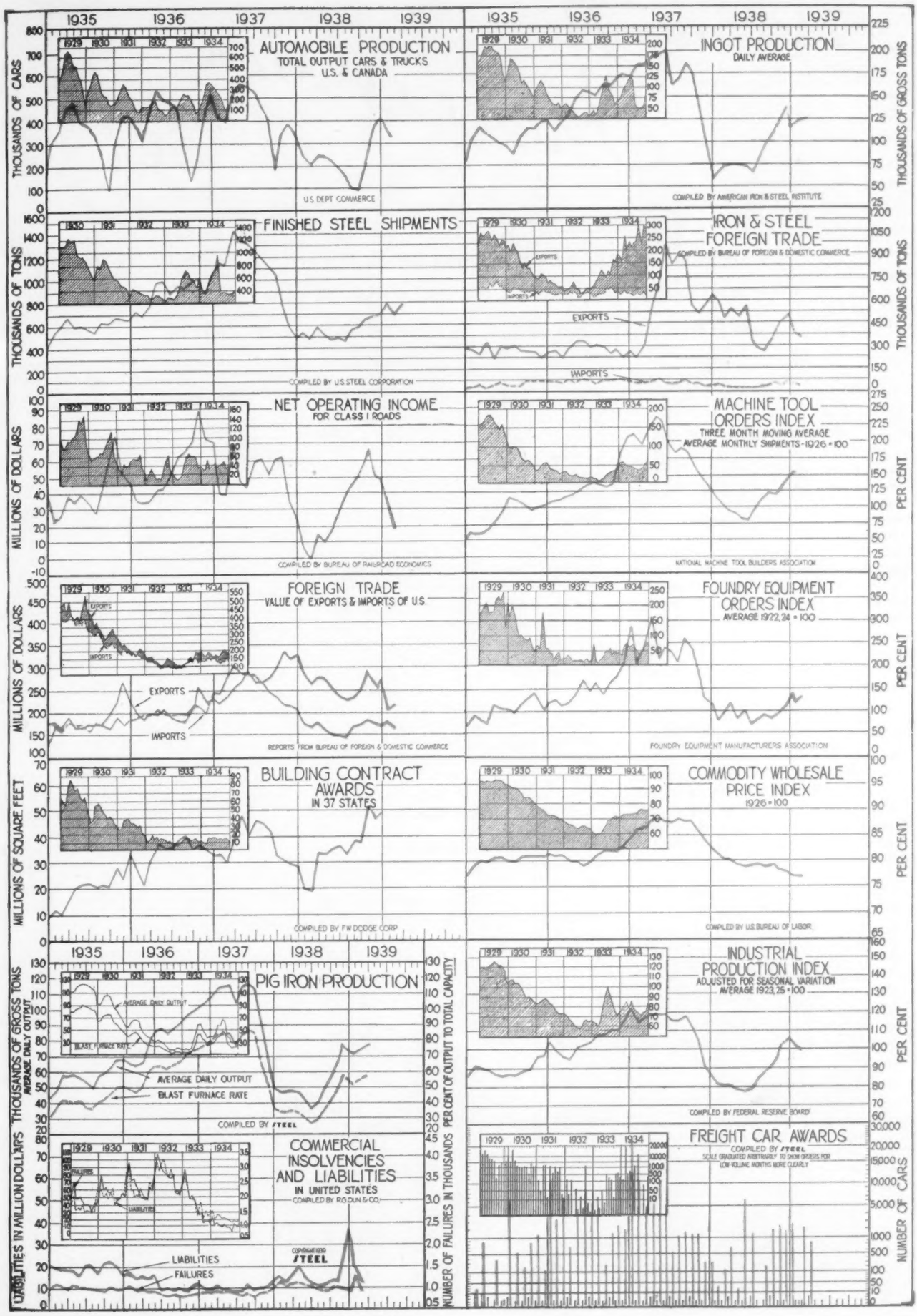








Week ending	Steelworks Operating Rate Per Cent			Electric Power Output Million KWH			Freight Car Loadings Thousands of Cars			Weekly Auto Output		
	1938	1932	1929	1938	1932	1929	1938	1932	1929	1938	1932	1929
Dec. 31	40.0	13.0	38.5	2,120	1,415	1,638	500	407	638	75,215	25,598	23,967
	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929
Jan. 7	51.5	26.0	25.0	84.0	2,169	2,139	1,619	1,542	531	552	573	799	76,685	54,084	30,755	75,000
Jan. 14	52.0	29.0	26.0	82.0	2,269	2,115	1,602	1,734	587	580	572	914	86,925	65,735	31,416	95,000
Jan. 21	51.5	30.5	27.0	83.0	2,289	2,108	1,598	1,737	590	570	562	932	90,205	65,418	29,365	105,000
Jan. 28	51.5	33.0	28.5	84.0	2,292	2,098	1,588	1,717	594	553	560	926	89,200	59,365	28,950	115,000
Feb. 4	53.0	31.0	28.5	85.0	2,287	2,082	1,588	1,728	577	564	575	947	79,410	51,443	27,110	116,000
Feb. 11	54.0	30.0	27.0	86.0	2,268	2,052	1,578	1,726	580	543	562	956	84,500	57,810	29,320	116,000
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100	30,410	116,500
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,150	116,500
Mar. 4	56 0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	78,705	54,440	31,390	116,500
Mar. 11	56 5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438	31,110	116,500
Mar. 18	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558	30,590	117,000
Mar. 25	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800	32,892	117,500
Apr. 1	54.5	36.0	23.0	95.0	1,210	1,979	1,480	1,680	604	523	545	967	85,980	57,500	35,756	120,000
Apr. 8	53.5	32.0	22.0	95.5	2,173	1,990	1,465	1,663	535	522	545	956	87,019	60,975	35,390	138,417


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS
U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS
IN 37 STATES
MILLIONS OF SQUARE FEET
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
1935 1936 1937 1938 1939
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
THOUSANDS OF GROSS TONS
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

Making Inexpensive Dies

By electroforming a copper alloy or iron shell over a suitable model and backing up this shell with bronze, brass or iron, dies for die casting may be produced economically. Process is outlined here

By J. F. RIELEY

■ BY A MODIFICATION of an established process used for reproduction and electrotyping, it is now possible to build dies for die castings and molds for plastic materials. This process renders possible economical production of dies and molds; in fact, after a model of the desired part has been obtained, the cost of die or mold production will depend upon the size and weight of die blocks rather than upon the nature of the cavity. Process consists in electroforming a shell over a suitable model and backing such shell up with bronze, brass or iron.

It is necessary to obtain a model having a finish at least equal to the finish required on the desired part. As to size, such model may be either the true size of the required part or sufficiently larger to allow for solidification shrinkage. Such model may be almost any material: Metal, plaster, wood, or a high melting point wax.

Duplication of present dies or molds may be accomplished directly from castings produced in existing dies or moldings in existing molds.

After such model has been obtained, if of a material which is a nonconductor of electricity, it is necessary to render the surface conductive. This may be accomplished by rubbing it with a very fine graphite such as that used in the production of electrotypes, or the surface may be dusted with a very fine lacquer. If the model is of metal or other electrically conductive material, it will have to be treated by some process which will render it separable from finished die or molds. This treatment may consist in graphiting as above, although a drop of oil may be necessary to make the graphite adhere; or a coating of silver iodide may be built up by plating the metallic model with silver, after which the silver plate is treated with ordinary medicinal tincture of iodine. This treatment produces a coating of silver iodide which is a good electrical conductor, but one which is readily separable from the metallic model.

The treated model then is mounted upon a graphite plate, brass plate, or other convenient medium which will serve to make a parting line.

After these preparations have been made, the treated and mounted model is suspended in an electroplating bath and plated to the thickness which will provide a shell strong enough to withstand handling and the heat requisite to backing.

Such shells may be any of several materials depending entirely upon the properties desired. Copper or brass shells are useful where very

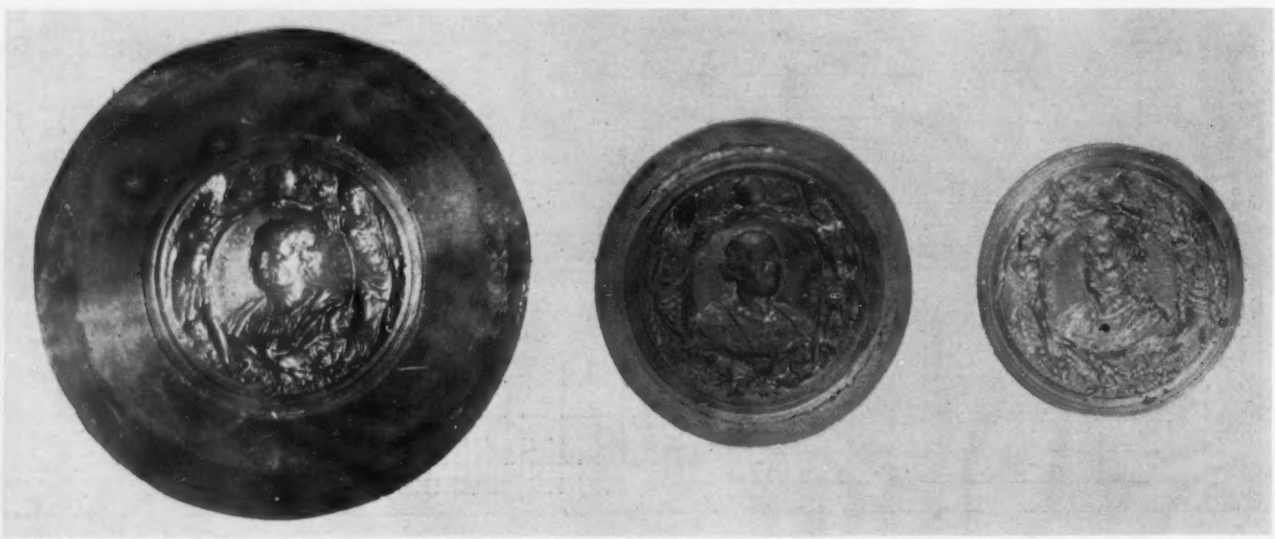


Fig. 1 (Left)—Copper shell model of Columbian exposition medal, mounted in a graphite plate, ready for plating operation. Fig. 2 (Center)—Completed die block with beryllium copper backing. Fig. 3 (Right)—Zinc alloy die casting made with die shown in Fig. 2

little strain is encountered—such as in the production of lead castings; nickel may be used when zinc castings are desired, or other alloy shells are occasionally useful. However, iron probably presents the best and most useful shell. Electrolytic iron may be case-hardened, is cheap to produce, requires no further treatment of surface, such as chromium plating, which is desirable on the other shells mentioned.

In order to make a shell which will be held firmly in the backing material, it has been found convenient to force treeing of the back surface.

DETAILS OF EXPERIMENT—IRON DEPOSITION SOLUTION

Constituent	Original Formula	Additions
Ferrous Chloride	40 oz./gal.	None
Calcium Chloride	45 oz./gal.	None

Volume: 5 gals. approx. Temp.—180 deg. Fahr.

Current		Cathode		Anode	
Amperes	20	Number	1	Number	2
Amp. per sq. in.	0.513	Material	Copper	Material	Swedish iron
Anode	0.513	Size	7 in. diam.	Size	3 x 6½ x ⅛ in.
Cathode	0.513	Approx. area	39 sq. in.	Approx. area	39 sq. in.
Time	31 hr.	Preparation	Graphite	Composition	Iron
Voltage	Board, 4.5 Tank, 3.8			Dist. from Cathode	8 in.

Backing Material a Problem

The problem of what material to use for backing the electroformed shell is very important. The properties of copper alloys, such as high coefficient of heat conductivity, make such a backing material desirable for some purposes; although the coefficients of expansion of the copper base alloys are quite a bit higher than the iron of the shell. In some cases, this difference in expansion may cause a breakdown of the die, particularly where a constantly recurring cycle of heating and cooling is found—such as in the use of water-cooled die-casting dies. Iron backing materials may be used, making a more homogeneous block and one in which the differences in expansion are negligible.

The backing material may be applied in several different ways: By brazing or welding until such weld is built up to the desired thickness, or by pouring molten metal directly upon the back of the shell. However, one of the best and easiest ways to apply backing material is by metal-spray. Application of metal by the spraying process has little tendency to warp the electroformed shell, requires no pre-heating of such shell. It presents the most feasible means of applying iron backing. Of course, the metal spray will not have the compressive strength of the welded, brazed or poured backing materials, so it may be necessary to resort to these means in some instances. Beryllium copper is an advantageous alloy to use in some cases.

Fig. 6—In the plating operation this treeing was forced by use of low amperage in order to facilitate holding shell in the backing material

After application of backing material, block is machined to size in the usual manner and, in the case of die-casting dies or injection molds, may be inserted into a cast iron or semisteel nest. In the more usual type of molding, blocks may be bolted directly upon the heater plate.

Of course, as is usual in almost any type of die, hardening is desirable. Hardening of iron shells may be done in the usual way if such shells are backed up by sprayed or welded steel. If other materials are used, or if it is desired to harden before backing, special means of hardening may be necessary.

Tests Process

In an experiment conducted by the writer to determine practicability of the method of die forming described above, model chosen was a copper shell in low relief copied from a Columbian exposition medal, Fig. 1. This shell was mounted in a graphite plate, as shown in Fig. 4. Back of the graphite block was coated with lacquer to stop plating of iron on this surface. Face of the copper shell was rubbed vigorously with colloidal graphite, and after attaching a suitable conductor to the graphite block, it was ready for the iron plating solution.

After plating was completed, shell was inverted and cavity was filled by placing in it the copper model from which it was made. Shell and model then were placed in sand, the copper model down. A steel ring about 7 inches in diameter was placed around the whole, and 2.25 per cent beryllium copper was poured on. This backing adhered closely upon the trees, which had been forced by use of low amperage. After machining, the finished block appeared as shown in Fig. 2, and diagrammatically in Fig. 5.

This block of composite structure was inserted in a steel die block forming the cover half of a die. Ejector half was made in the usual manner. Die castings formed with this finished die were made from a zinc alloy and appeared as shown in Fig. 3.

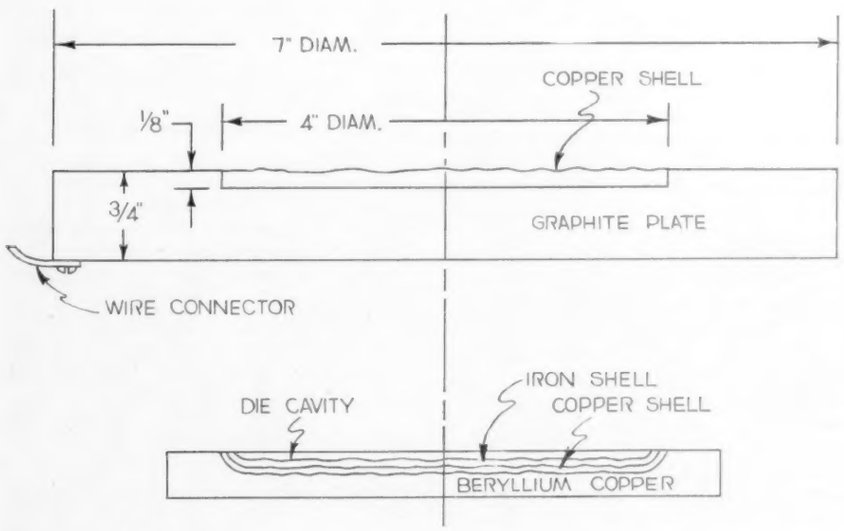


Fig. 4 (Upper)—Diagram showing how copper shell model was mounted in graphite plate. Fig. 5 (Lower)—Cross section of completed die block

Foundry Iron

Relative advantages of Southern ores are discussed from the standpoint of their suitability for use in the gray iron foundry. Need for mixing ladles or some means to assure uniformity of cast is pointed out

By J. P. DOVEL
James P. Dovel & Co. Inc.
Birmingham, Ala.

■ FREQUENTLY the question is asked, "Why is iron, made from brown ore, better than iron made from red ore?"

A more logical question would be, "Why does iron made from brown ore given better results in the gray iron foundry than iron made from red ore?" Of course, there is no difference whatever as far as the iron outside of the ore is concerned. The difference in results obtained from iron made from brown ore and that from red ore is due entirely to the alloying elements present, manganese and phosphorus.

Brown ores from southern Appalachian fields carry considerable manganese, some are rather high in phosphorus, and some contain less phosphorus than the principal red ore deposits in the Birmingham district. One of the principal brown ore deposits in the vicinity of Russellville, Ala., produces iron of about 0.60 per cent manganese and 1.00 to 1.30 per cent phosphorus, while red ore usually produces iron of 0.22 per cent manganese and about 0.87 per cent phosphorus.

A direct effect of either of these alloying elements is to weaken the iron to some extent and to produce a tendency toward brittleness and increased shrinkage in gray iron castings.

Manganese Affects Ferrite

The indirect effect of manganese is its action on the ferrite in the molten iron. Its great affinity for oxygen sets up a reaction between the manganese and the oxygen in the ferrite, resulting in manganese oxide. Impurities in the ferrite, such as silicon and alumina, also are liberated and float to the top producing what foundry men call "kish." Apparently, all iron coming from the blast furnace carries some ferrite (partly reduced ore). This ferrite is immediately attacked in the runner or ladle by the manganese, liberating the impurities together with the manganese oxide which floats to the top.

This reaction is very active in the runner, owing to the iron being spread out in a thin sheet. After these impurities have been floated out, they cannot cause any serious trouble in the cupola. As the cupola is not a deoxidizing apparatus, they will float on a cupola ladle and can be skimmed off. Some practical foundrymen introduce ferromanganese in the ladle in order to get this reaction.

Time Element Important

This method requires that the iron remain in the ladle some little time. If the iron is to be used in castings with extremely thin sections, this time element may be objectionable as iron for such work must be poured quite hot. This is probably one reason why some foundrymen prefer sand-cast iron for thin section work. Also sand-cast iron does not break down in the cupola at as low a temperature as machine-cast iron. The casting of iron in sand has almost become a lost art, as nearly all furnace operators have gone to machine casting. This was first brought about by the steel producers as a matter of economy and convenience and because sand was objectionable in the steel furnace. Later developments have made it possible to cast cheaper in the sand.

Another feature that should be considered is that iron coming from the blast furnace may be of two or three different grades in the same cast. An extensive investigation along this line showed that from 100 casts a little more than 30 per cent included two grades to the cast and 10 per cent showed three grades to the cast, an important variation.

Samples taken of the cast and analyzed as one sample did not show correct grades as one end of the cast could be No. 2, soft, and the other end could be No. 3, foundry, while the analysis would show No. 2, foundry, for the whole cast. In shipping, one customer would get No. 2, soft iron, while the other would get No. 3, foundry iron, on his No. 2, foundry, order. The shipper probably would have to make an adjustment to the customer that received the No. 3, foundry, and both customers would be dissatisfied. Of course, a mixture of No. 2, soft, and No. 3, foundry, does not produce a No. 2, foundry, fracture. Both types are of closer grain than a high graphitic carbon No. 2, foundry, and would not carry as much scrap in the melt.

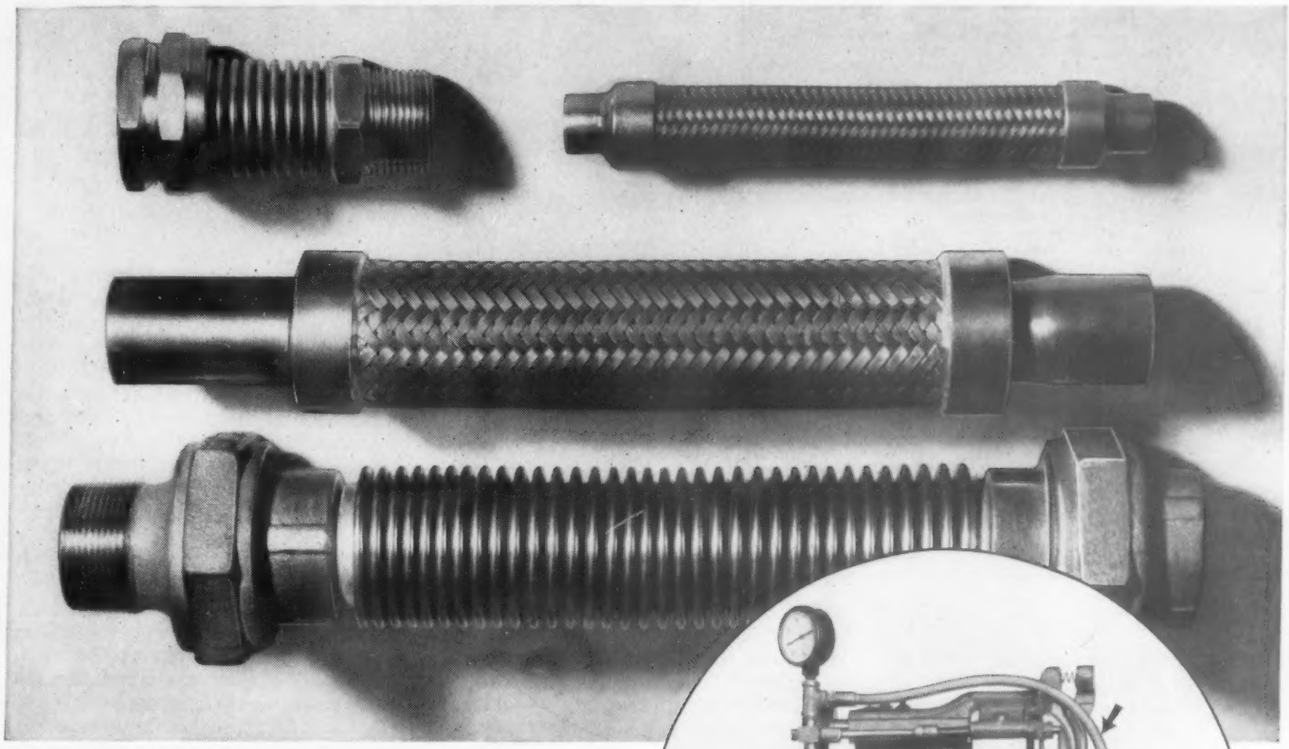
With the fact established that the different grades of iron in over 30 per cent of casts coming from the blast furnace do not thoroughly alloy in the crucible of the furnace, it leaves a doubt as to whether the iron cast directly into the ladle will mix thoroughly and produce a uniform grade throughout the whole cast. Complaints from both producers and users about iron not being uniform confirm these doubts.

Phosphorus Helps Molding

As to phosphorus in pig iron, there is considerable difference of opinion by foundrymen as to its merit or demerits. It is admitted, however, that iron containing 1.0 to 1.2 per cent phosphorus molds better than iron with a lower phosphorus content. When cast, it molds into thinner sections than a lower phosphorus iron and will permit lower silicon content in the melt. The lower silicon will more than offset any weakness due to presence of phosphorus as comparative tests with lower phosphorus iron have shown.

Seamless *Flexible* Connectors

...THE SAFETY LINK BETWEEN TWO MOVING PARTS



Assemblies of American Seamless Flexible Metal Tubing with various types of end fittings used as leak-proof flexible connectors for taking up vibration, misalignment, etc.

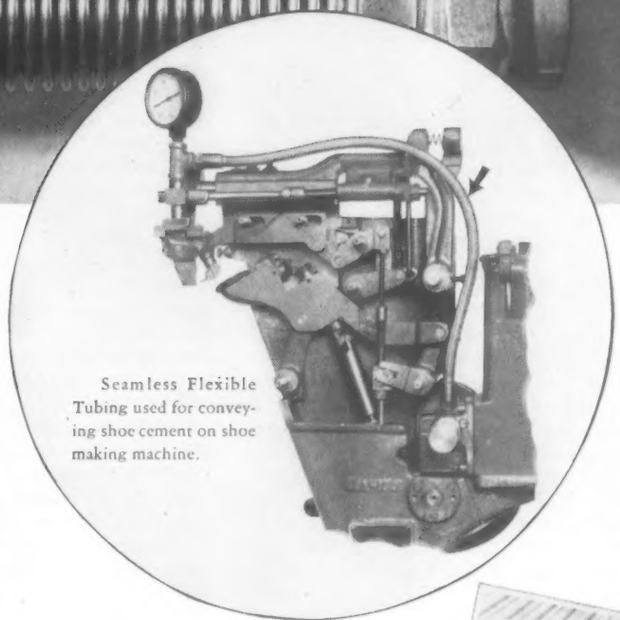
THE installation of American Seamless Flexible Metal Tubing is cheap insurance against the need for future servicing. Wherever you need a flexible connector or conductor . . . for misaligned or moving parts, for absorbing vibration . . . the one best answer lies in the use of American Seamless Flexible Metal Tubing.

There are no joints, welds, laps, seams or packing where leaks can occur. For the conveyance of air, water, oil, steam or fuel, this flexible tubing has no superior. That's why more and more designers of machinery and maintenance engineers are specifying "American Seamless."

Write us about your connector problems. Our engineering department has a wealth of information on the use of "American Seamless" on all types of machinery. Consultation of this department entails no obligation.

ANACONDA
from mine to consumer

39845



Seamless Flexible Tubing used for conveying shoe cement on shoe making machine.

FREE REFERENCE HANDBOOK ON SEAMLESS FLEXIBLE METAL TUBING

The most dependable *flexible* connector for conveying liquids or gases under high pressures...made from special *seamless* tubes of any workable metal. Handbook contains descriptions, illustrations and valuable engineering data. Write for Bulletin SS-3.

American Metal Hose

ANACONDA
from mine to consumer

AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Conn. • Subsidiary of Anaconda Copper Mining Company

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

OPEN HEARTH

American Institute of Mining and Metallurgical Engineers

COMMITTEE

The National Open-Hearth Committee is very happy to invite anyone who is associated with the iron and steel industry to attend the annual conference which will be held on April 26, 27 and 28 in the Cleveland Hotel, Cleveland, O.

These meetings have grown in interest and importance from the day when a score of steel men met in the Wm. Penn Hotel, Pittsburgh, in 1925 until four hundred attended the 1938 conference in Buffalo, N. Y. Now practically every steel plant in the United States sends representatives.

The Minutes of the conference mirror the development of the art and the industry from year to year. They are in great demand by steel managers in foreign lands.

Many problems dealing with personnel, equipment, operations, refractories, slag control and metallurgical problems will be discussed at this conference.

Come and take an active part in our deliberations.

Our motto is: "Give the other fellow the benefit of your experience."

Sincerely yours,
L. F. Reinartz,
Chairman,
Open-Hearth Committee
A. I. M. E.

OPEN HEARTH and B
Meeting at
April 26, 27

■ WHEN the Open Hearth committee of the American Institute of Mining and Metallurgical Engineers held their first meeting in Pittsburgh, April 15 and 16, 1925, at the suggestion of J. V. W. Reynders, the idea of organization was received favorably by the executives of various steel companies.

Purpose of the committee was to make detailed studies of the steelmaking process from the standpoint of production, cost and quality. At the outset three subcommittees were appointed. That covering furnace design had the following members: Kent Harrison, Donner Steel Co., chairman; R. J. Cain, Bourne-Fuller Steel Co.; Frank King, Weirton Steel Co.; Kenneth McCutcheon, American Rolling Mill Co.; and J. R. Mountain, Trumbull Steel Co.

Members of the Practice and Yield committee included G. D. Tranter, American Rolling Co., chairman; George Kitto, Pittsburgh Steel Co.; A. W. Smith, Youngstown Sheet & Tube Co.; B. P. Wheeler, Wheeling Steel Corp.; R. L. Leventry, Republic Iron & Steel Co.; and H. B. Hubbard, Inland Steel Co.

The Refractories committee included the following: G. A. Bole, bureau of mines, chairman; A. R. Maxwell Jr., Pittsburgh Steel Co.; N. E. McCallum, Phoenix Iron Co.; and M. C. Shannon, Gulf States Steel Co.

The gatherings always have been informal. Instead of papers being delivered before the meetings, details of open-hearth practice are explained and compared by various operators impromptu from the floor in the nature of a round table discussion. Any operating man in the audience is entitled, and is welcome, to discuss subjects.

Since its inception, the Open Hearth committee has been the clearing house for ideas and suggestions in regard to increasing tonnage. Open-hearth superintendents, many weeks before the annual meeting is held, are asked to submit questions; these later appear on the program for discussion at the various sessions. The meetings always have been marked with an atmosphere of frankness. Views are expressed as though the men were sitting opposite each other in the open hearth shop.

Since 1925, conferences of the Open Hearth committee have been held in Pittsburgh, Chicago, Cleveland, Buffalo, Detroit, Youngstown, O., Cincinnati and Birmingham, Ala., and have totaled 21. From 1925 to 1932, the meetings were held in the spring and fall, but since 1932 the gatherings have been in the spring only. Attendance has increased from 26 at the first meeting in Pittsburgh to 357 at the Buffalo meeting held in 1938.

Clyde E. Williams

L. F. Reinartz

Francis H. Crockard

nd
at
26,

BLAST FURNACE Cleveland 27 and 28

■ HISTORY of the Blast Furnace and Raw Materials committee of the American Institute of Mining and Metallurgical Engineers begins with a luncheon meeting, May 21, 1931, at the Engineers club, New York, when Col. F. B. Richards first presented the plan to a group of delegates representing Iron & Steel division, Iron Ore committee, Mining Geology committee (all of A.I.M.E.), Eastern States Blast Furnace & Coke Oven association, Chicago blast Furnace and Coke Oven association and the former Southern Ohio Pig Iron and Coke association.

It was resolved that a committee called the Blast Furnace and Raw Materials committee be appointed to act as the governing body for the Blast Furnace and Raw Materials conferences; that this committee replace the present Blast Furnace, Coke Oven and Iron Ore committees of the Iron and Steel division; that these conferences be held semiannually, one conference each year being held in New York at the time of the annual meeting in February, and another being held in the Fall in either the Chicago, Pittsburgh or Cleveland district; that these conferences be held for the purpose of discussing technological problems connected with the mining, preparation and beneficiation of raw materials entering into the blast furnace, and with blast furnace and coke oven practice; that such conferences be open to all those interested.

Col. F. B. Richards, the first chairman served until 1935, when Ralph H. Sweetser, the present chairman, was appointed by the executive committee of the Iron and Steel division. The secretaries have been, successively, Clyde E. Williams, Ralph H. Sweetser and Francis H. Crockard, who are elected by the members of the committee at the April meetings, as are the two vice chairmen.

The committee now has an international membership, with the aim of having it as the clearing house for the best blast furnace practice all over the world. This committee supplements the work and meetings of the Pittsburgh and Chicago Blast Furnace and Coke Oven associations. All three groups work together.

At the April meeting in Birmingham, held at the same time as the Annual Open Hearth conference, April 1, 1937, a joint meeting of the Blast Furnace and Open Hearth committees was held with such good results that the second joint session was held in Buffalo last April. The program for the third such meeting to be held in Cleveland, has many important items of mutual interest to the iron men and the steel men of the entire country.

Iron and Steel Division

American Institute of Mining and Metallurgical Engineers

Committee on Blast Furnace and Raw Materials

A most cordial invitation is extended to all men interested in making, using and studying pig iron, and to those engaged in the mining and processing of the raw materials required in the production of pig iron, to come to Cleveland on April 26 and 27 to attend all technical and social sessions.. It is not necessary to be a member of the American Institute of Mining and Metallurgical Engineers to be admitted nor is there any registration fee for the blast furnace meeting.

The two sessions on Wednesday include papers on practical operations in this country and in South Africa. There will be some theoretical papers included and it is likely that the floor discussions will bring out some interesting facts and theories.

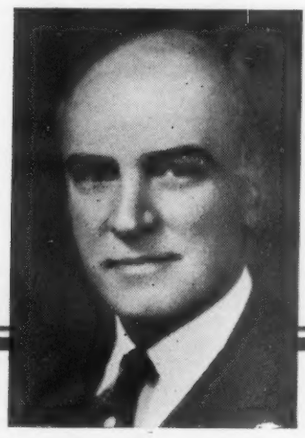
The joint session with the open-hearth men on Thursday morning is sure to be of great value to steel men as well as to blast furnace men. It will deal with such important matters as best temperature of hot metal for open-hearth practice, etc.

You are certain to hear much of interest.

Sincerely,

Ralph H. Sweetser,

Chairman,
Blast Furnace and Raw Materials
Committee of A. I. M. E.



W. A. Haven

Ralph H. Sweetser

A. J. Boynton

INGOT YIELD INCREASED UP TO 3% BY LAPIX*

★ WHAT LAPIX IS

First introduced to American steel mills early in 1938, Lapix was discussed in detail at the Open Hearth Meeting last spring by steel men who had been testing it.

Lapix is a finely powdered, amorphous insulating material which is applied to tops of ingot heads immediately after pouring.

It is a mixture of several ingredients including silicates, together with a form of carbon compound which cannot be picked up by steel, hence no recarburization. It does not smoke, fume or give off odor.

WHAT LAPIX DOES

★ A HOUGHTON INSULATING MATERIAL TO REDUCE TOP DISCARDS

It spreads over the top of the exposed metal, forming an insulating blanket. This keeps the metal molten for a sufficient time to permit gases to escape and segregates to within a narrow range under the sinkhead. There is no bridging or crust formation. Lapix follows the surface of the metal down into the mould as normal contraction occurs, thus retaining the heat.

Now in use in a number of the largest mills, Lapix has definitely reduced top discards, also porosity and secondary pipe where such tendencies occur.

Photo Courtesy Robert Yarnall Ritchie

★POROSITY and SECONDARY PIPE DEFINITELY REDUCED

WHAT LAPIX SAVES

By minimizing the metal required in the hot top of killed steel ingots, Lapix has a positive record of increasing ingot yield from 1 to as much as 3%. Only 1½ pounds are needed per ton of ingot, therefore adequate protection is afforded at an average cost of six cents per ton.

WHO SELLS LAPIX

E. F. Houghton & Co. (established 1865) manufactures this material in its own plants. Lapix is 100% American, the sources of supply for the raw materials being right here in the United States. This company makes a variety of special industrial products as listed below, and maintains sales and service offices in all principal cities. It has established a Steel Mill Division with headquarters in Pittsburgh.

Write to the address below for results of production runs where Lapix has been used profitably.

Houghton Products for Steel Mills
METAL CLEANERS, QUENCHING OILS, HEAT TREATING SALTS, PICKLING INHIBITORS, CUTTING OILS, RUST PREVENTIVES, SPECIAL STEEL MILL LUBRICANTS, VIM LEATHER PACKINGS, VIM TRED LEATHER BELTING.

Steel Mill Division

E. F. HOUGHTON & CO.

BESSEMER BUILDING, PITTSBURGH, PA.

Factories — Philadelphia :: Chicago :: Detroit

Sales offices in all principal cities

PROGRAM

Blast Furnace and Raw Materials Committee and Open Hearth Committee of the A. I. M. E.

■ THOSE attending the committee sessions will find a trip through the world's largest continuous strip mill planned as part of the program. Visitors also will find many other interesting points in Cleveland. A major iron and steel producing center, Cleveland is located at the crossroads of commerce. A fleet of more than 300 freighters brings iron ore to the 15 blast furnaces in the Cleveland district.

In steelmaking capacity, Cleveland's 5,712,000 tons annually is about 8.2 per cent of the country's total. In this district also are 803 by-product coke ovens, 71 basic open-hearth furnaces, two bessemer converters and 10 electric furnaces. These are operated by Republic Steel Corp., American Steel & Wire Co., Otis Steel Co., all of Cleveland; and National Tube Co., Lorain, O.; Timken Steel & Tube Co., Canton, O.; and Empire Sheet & Tin Plate Co., Mansfield, O.

Five technical sessions will be held during the Open Hearth conference, and three sessions will be held by the Blast Furnace and Raw Material group.

WEDNESDAY, APRIL 26

9:00 A.M.—Registration—Open Hearth and Blast Furnace and Raw Materials Committee—Mezzanine Floor.

OPEN HEARTH

10:00 A.M.—Opening Address—L. F. Reinartz, General Chairman, National Open Hearth Committee, A. I. M. E.—Ball Room (Mezzanine Floor).

Industrial Relations

R. K. Clifford, Chairman

C. R. FonDersmith, Vice Chairman

The Settling of Grievances — Russell Chaffin, Director of Industrial Relations, Continental Steel Corp., Kokomo.

Safety in the Open Hearth—C. R. FonDersmith, Supt. Open Hearth, The American Rolling Mill Co., Middletown.

Subjects for Discussion

(a) Training and Practical Use of Metallurgical Observers in the Open Hearth.

(b) Training foremen and men in the Open Hearth Department to follow cost;—quality;—fuel;—repairs.

(c) What done to improve working conditions in the Open Hearth Department.

(d) Checking Open Hearth practice for quality.

BLAST FURNACE AND RAW MATERIALS

10:00 A.M.—Opening Address—Ralph H. Sweetser, Chairman, Blast Furnace and Raw Materials Committee, A. I. M. E.—Empire Room (Parlor Floor).

Solution Loss and Slag Volumes

H. A. Strain, Chairman

W. E. Brewster, Vice Chairman

Effects of Solution Loss Reactions Upon Blast Furnace Economy—P. V. Martin, Asst. Supt. Blast Furnaces, South Works, Carnegie-Illinois Steel Corp., Chicago.

Low Slag Volumes and Resulting Effects on Cost and Quality—G. E. Steudel, Division Supt. of Blast Furnaces, South Works, Carnegie-Illinois Steel Corp., Chicago.

12:15 P.M.—Welcoming Luncheon—Open Hearth and Blast Furnace and Raw Materials Committee—Red Room (Mezzanine Floor).

Addresses of Welcome

Harold Burton, Mayor of Cleveland, and D. B. Gillies, President, A. I. M. E.

OPEN HEARTH

2:00 P.M.—Open Hearth Refractories—Ball Room.

Gilbert Soler, Chairman

Harley C. Lee, Vice Chairman

Discussion of furnace bottoms.

a. Plastic chrome bottoms.
b. Use of various types of magnesite, such as Seawater, Thomasite, Austrian, Canadian, Washington, etc.
c. How to keep bottoms clean. How are old bottoms resurfaced? What materials are used?

Use of basic brick and other special materials in open hearth furnaces other than bottoms.

a. Bulkheads.
b. Back walls.
c. Roof.

Improvements in checker construction.

a. Special brick and special settings.
b. Multiple checkers.
c. Other designs.
d. Do checkers run hotter in insulated furnaces?

Refractories and tapholes.

a. Materials used.
b. Control practice.

Runners and ladles.

a. What progress is being made with basic materials?
b. Other materials and designs.
c. Methods used for lining ladles; composite ladle lining (2 different types of brick—same ladle).

Ladle accessories: Sleeves, stopper heads and nozzles.

a. Materials and designs in use for sleeve brick.
b. Materials and designs in use for stopper heads.
c. Materials and designs in use for nozzles.
d. Type of bond between the sleeve brick and mixtures used for nozzle well.
e. What special qualities are desired for a nozzle?

Hot tops and mold plugs.

a. Various types of hot tops in use.
b. Relative advantages of permanent hot tops vs. clay hot tops, in different types of steel in regard to cost and quality.
c. Mold plugs.

What refractory specifications are necessary for the open hearth operator in order to obtain uniform and satisfactory refractory materials?

a. Bottom materials.
b. Basic and chrome brick, etc.
c. Ladle brick and fire brick.
d. Silica brick.
e. Pit refractories: sleeve brick, stoppers, nozzles, hot tops, mold plugs.
f. Other refractory materials.

Needs for future development by the refractories industry in order to increase the operative efficiency, improve quality and lower overall cost in the open hearth.

BLAST FURNACE AND RAW MATERIALS

2:00 P.M.—Operating Practice; Raw Materials—Empire Room.

Horace Allen, Chairman

J. H. Slater, Vice Chairman

Blast Furnace Practice in South Africa—J. A. L. Ortlepp, African Metals Corp., Johannesburg.

Low Temperature—Vacuum Metallurgical Process—Alfred Musso, Cons. Engr., New York City.

Freight Costs of Iron Ore—H. M. Roche, Cons. Engr., Dover, N. J.

THURSDAY, APRIL 27

9:30 A.M.—Joint Session—Open Hearth and Blast Furnace and Raw Materials Committees—Ball Room.

L. F. Reinartz, General Chairman

J. W. Kinnear, Jr., Co-chairman for Open Hearth

A. J. Boynton, Co-chairman for Blast Furnace

How Silico-Manganese improves Rimming Steel

WHEN silico-manganese is added to rimming steel shortly before tapping, a cleaner, better steel is produced. The inclusions formed have appreciably lower melting points and are of a modified type. Results indicate that this modified type of inclusion decreases the age-hardening tendency of rimming steel. In addition, this silico-manganese treatment permits a reduction in the use of other deoxidizers that lead to objectionable inclusions.

Ask to have one of our metallurgists call and explain more fully the advantages of silico-manganese for producing rimming steel. He will gladly help make your use of this and other "Electromet" ferro-alloys more profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Items of Interest about other "Electromet" Ferro-Alloys

Vanadium Improves Steel Castings — The addition of a small amount of vanadium, usually not over 0.10 per cent, to steel castings refines grain, materially raises yield-point strength without sacrificing ductility, and greatly increases resistance to shock and fatigue. This is especially useful in engine and railroad car castings.

For Fine-Grained High-Chromium Steels, Use High-Nitrogen Ferrochrome—High-nitrogen ferrochrome adds nitrogen as well as chromium to high-chromium steels. Nitrogen in small amounts greatly refines the grain size of these steels, reduces objectionable grain growth at high temperatures, and materially increases strength and toughness. Machinability and corrosion resistance are retained.

Columbium Eliminates Quenching of Welded Austenitic Stainless Steel Equipment — When columbium is added to the austenitic stainless steels, a stable carbide is formed which makes the steel immune to intergranular corrosion. Hence columbium-bearing stainless steel equipment welded with columbium-bearing welding rod does not have to be quenched from a temperature of 2,000 deg. F. to regain full corrosion resistance. This eliminates a costly and time-consuming fabricating step.

For Cleaner Steel, Make a Final Addition of Calcium-Manganese-Silicon — Calcium-manganese-silicon, used as a final alloy addition to steel, produces a cleaner, coarse-grained steel with deep-

hardening properties. Long commercial use of this combination alloy has proved its merits for this purpose. Calcium-manganese-silicon is also being successfully used to deoxidize all types of stainless steel, high-speed tool steels, and special steels subject to transverse testing.

Zirconium Inhibits Carbon Segregation — Zirconium added to killed steel in the ladle diminishes the variation in carbon content within the ingot. By thus inhibiting carbon segregation, zirconium makes grain structure and properties more uniform throughout the ingot.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service, S3-16."

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trademark of Electro Metallurgical Company.

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

Subjects for Discussion

What the open hearth requires from the blast furnaces.

Meeting the open hearth requirements.

What is the economical amount of open hearth slag that can be used in the blast furnace with respect to final ingot costs?

Have mixer type ladles justified their adoption—(1) where they have replaced small ladles; (2) for new installations?

To what extent may blown metal be substituted for steel scrap. What grade of iron is most economical for the production of blown metal?

Can the use of high silicon iron in the open hearth be justified by the extra amount of iron ore it will reduce?

Effect of Hot Metal Analysis and Casting Temperature on Open Hearth Quality—L. H. Nelson, Asst. Openhearth Supt., Republic Steel Corp., Buffalo, N. Y.

12:15 P. M.—Executive Committee, Open Hearth Committee—Luncheon Meeting—Room 1 (Mezzanine Floor).

12:15 P. M.—Blast Furnace and Raw Materials Committee—Luncheon Meeting—Room 5 (Mezzanine Floor).

INSPECTION TRIP

2:15 P. M.—Plant Visit—Open Hearth and Blast Furnace and Raw Materials Committees—Republic Steel Corporation, Cleveland Plant.

Chartered buses will leave the Hotel Cleveland at 2:15 P. M. for the Cleveland Plant of the Republic Steel Corporation. Members and delegates will be guided through the 98-inch continuous strip mill, the largest continuous mill in the world. Buses will leave the plant at 5:00 P. M. for the return trip to the hotel.

7:00 P. M.—Fellowship Dinner-Smoker—Ball Room.

Tickets $2.50 including Cocktail Party. Speaker: Harry Sain, Special Representative, Industrial Commission of Ohio—"Safety in the Steel Plant."

FRIDAY, APRIL 28

OPEN HEARTH

9:30 A. M.—Open Hearth Operations—Ball Room

A. P. Miller, Chairman
W. C. Kitto, Vice Chairman

Construction and operation of an experimental open hearth furnace—Harold K. Work, Manager of Research and Development, Jones and Laughlin Steel Corp.

Discussion of the construction and operation of the new furnace at the Pittsburgh Steel Co.

Instrumentation of the modern open hearth furnace.
(a) Draft control.
(b) Automatic fuel-air ratio control.
(c) Automatic reversal.
(d) Roof temperature control.

Special Pyrometers for bath temperature recordings.

Bottom Pouring Practice.
(a) Improvement of the ingot surface compared to top pouring and is it justified.
(b) Tundish or basket pouring practice.

Improvements in surface and interior quality of ingots.

Crowe Slag Pockets.
(a) Application.
(b) Advantages.

Use of Light Scrap.

OPEN HEARTH

2:00 P. M.—Open Hearth Metallurgy—Ball Room.

C. H. Herty, Jr., Chairman
E. G. Hill, Vice Chairman

I. KILLED STEEL

Does aluminum act on grain size as effectively when in a combined state, such as ferro-aluminum, as in regular stick or shot aluminum?

What other final deoxidizers other than aluminum are in use and what effect have they on grain size?

Does bottom patching material have any effect on grain size control?

On forging quality steels of large grain size, is it better to over-deoxidize in the furnace or be on the lean side in furnace deoxidation and finish deoxidation in the ladle?

The use of silico-manganese in forging and other steels.

How does mold design affect the quality of the ingot?

II. RIMMED STEEL

In making 0.07 to 0.09% C. rimming steel, will the reduction in carbon from the range 0.15 to 0.20% be best accomplished by oreing down the heat or bringing down the carbon with rods? Which method is preferable in regard to the oxidizing action in the steel itself?

What is the best FeO content of slag for rimming 0.20% carbon steel?

What percentage of automobile scrap can be used in making extra deep drawing steel sheets?

Do copper additions or residual copper make rimming low carbon steel sluggish?

What effect does high or low residual manganese have on rimming steel?

In making low carbon rimming steel, where is the best place for aluminum additions—ladle—molds?

Does a 2 to 3 inch rise in a rimming ingot due to the addition of aluminum in the mold, have the same effect on skin thickness as a rising heat from furnace conditions?

How does mold design affect the quality of the ingot?

What defects in finished sheets can be traced back to open hearth practice?

III. SLAG CONTROL

To what extent has FeO control in slags been applied to everyday production of steel?

Method of slag control:
(a) Run to a predetermined iron oxide.
(b) Slag cakes as guide.
(c) MnO determination.
(d) Method of raising or lowering FeO.
(e) Control of viscosity.
(f) Lime—SiO_2 ratio.

Does the use of FeO control result in being able to hold to close analysis limits. How close?

How much iron oxide can be removed from the steel through the decrease in the FeO content of the slag?

Cause and cure of foamy slags?

IV. EFFECT OF CHARGE

Analysis of scrap available for open hearth use. Synopsis of paper read at St. Louis Iron and Steel Scrap Convention.

Metallurgical advantages of deep vs. shallow baths. Ideal bath depth for forging steels. Why? Is more or less limestone used in a shallow hearth?

Frequently said "Low limestone charge is the cause for poor quality steel." Has anyone any positive evidence of this fact?

Which is more oxidizing—a cold pig metal or hot metal charge? Why?

Does cast iron in the charge affect the quality of steel? If limited, what per cent of total charge is permissible?

Relative advantage and disadvantages of high ore, low silicon iron in the basic open hearth furnace.

How can you be sure of a good run-off slag?

V. GENERAL QUESTIONS

What advantages are attributed to holding heats at the pouring platform?
(a) Length of time.
(b) Kind of heat.
(c) Live or killed.
(d) If live steel, does a slag "boil" if a heat is held?

Working heats:
(a) Maximum ore and pig iron additions, and time of additions.
(b) Effect of spar.
(c) Use of sta-flux or burnt lime.
(d) Use of mill cinder or roll scale.
(e) Carbon at melt.

In acid practice, what are the advantages in using lime in the slag and what is the best percentage?

Influence of the following factor on the speed of carbon reaction in the open hearth furnace:
(a) Fuel.
(b) Slag volume.
(c) Atmosphere.
(d) Temperature.
(e) Influence of bath agitation.
(f) Viscosity of slag.

Adjusting Business to New Federal Regulation

■ *Adjusting Your Business to the New Legislation*, by Research Institute of America Inc., New York; 1065 pages, 7 x 9¼ inches; loose leaf, in fabrikoid five-ring binder; supplied by STEEL, Cleveland, for $12.85; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S. W. 1.

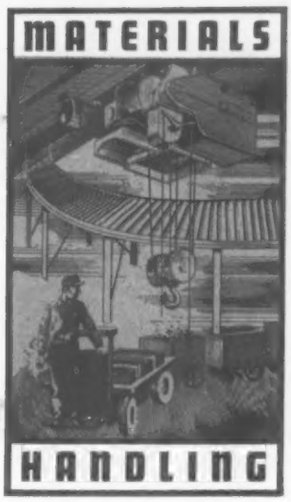
A double purpose is embodied in this publication, to avoid the penalties of violation of the endless chain of new laws regulating business and to turn to profitable account the favorable provisions in each law.

The business man is shown how he can avoid possible trouble and expense by knowing in advance what steps to take with regard to each federal law regulating wages, hours, labor standards, selling policies, prices, discounts and other business practices.

Business control laws explained in this book are the wage and hour law, labor relations act, pure food and drug act, federal trade commission act, Robinson-Patman act and other regulatory measures. Specific recommendations are offered on the steps that should be taken to comply with each law most conveniently and economically.

A chart of illegal business practices leads at once to the law applicable to the practice and the page on which it is discussed. A similar table presents state fair trade acts. A comprehensive index covers the entire subject matter, with frequent cross references.

ADVERTISING PAGES REMOVED



Electric Motor Cores

Five conveyors serve nine presses and two stacking machines, eliminating practically all handling operations in automatic setup which produces nearly 26,000 finished laminations per hour. Skeleton delivery ducts are pressure fed by presses

Part II

First part of this article described how standard 6-inch diameter disks were made. Second part, presented here, follows these disks through to finished rotor and stator laminations

■ POSSIBLY the most interesting stamping operations in the Westinghouse small-motor plant, Lima, O., are in connection with the automatic setup which blanks out stator and rotor punchings and slots these sections.

This automatic setup consists of three batteries of presses with stacker conveyors and belt conveyors arranged as indicated in layout diagram, Fig. 6. Flow of material through the various operations is indicated by the arrows. This entire setup is used to convert laminations for electric motor cores from cookie disks to the completely notched stator and rotor laminations shown in Fig. 8.

This work consists principally of three operations. In the first operation, the rotor disk is blanked out leaving a doughnut shaped piece which is the stator lamination. In the second operation, the rotor disk receives punchings to afford ventilation through the core and to permit entrance of the shaft through the core. Also, slots are formed for the windings. In the third step, the stator lamination is notched to receive stator windings and punched to receive mounting bolts or studs.

In Fig. 6 it will be seen that these operations are handled in three batteries, each of these three batteries containing presses to handle all of the three steps previously mentioned. Output of completed rotor disks travels crosswise the center of the layout on a conveyor which carries the laminations to an automatic stacking machine shown in Fig. 11.

The finished stator core punchings travel crosswise the process lines on belt conveyor which takes them to another automatic stacking machine.

This setup is primarily of interest because of the high degree of mechanization employed. Cookie disks, formed by special equipment described in Part I of this article, are the raw material fed to this automatic setup. These disks are placed in the automatic feeding mechanism on the rotor blanking

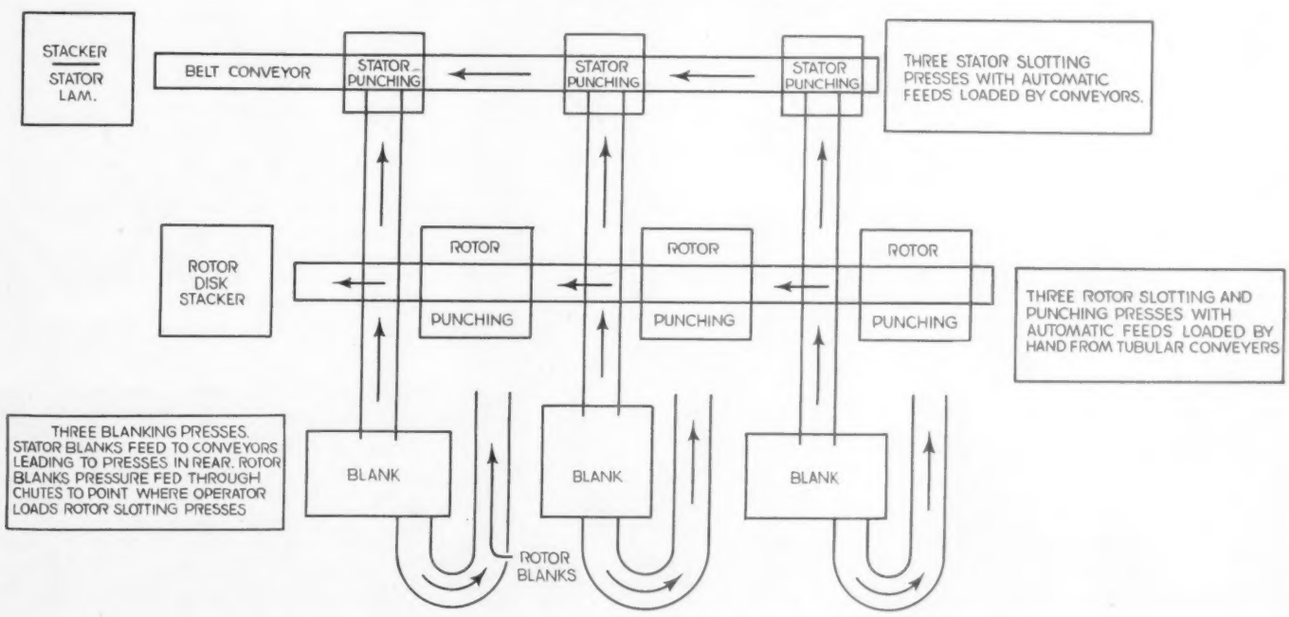
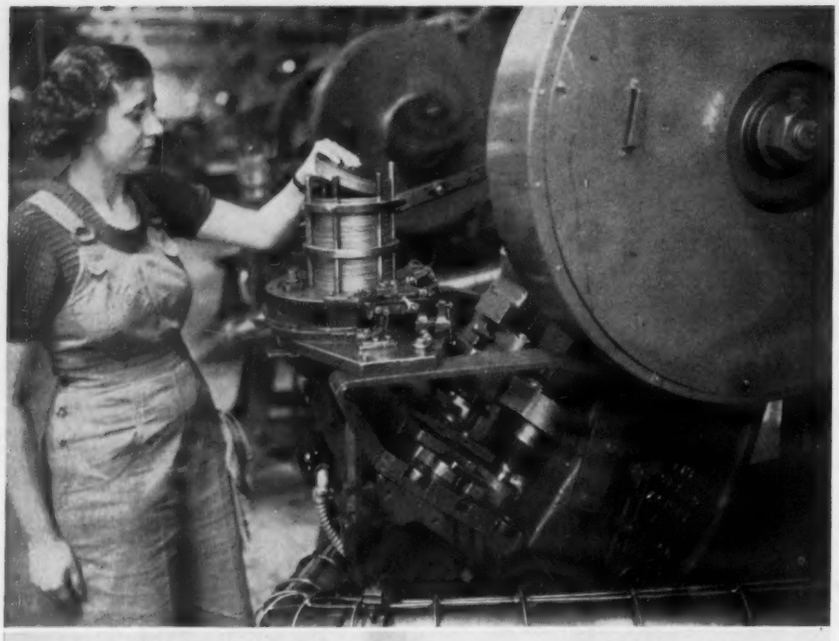
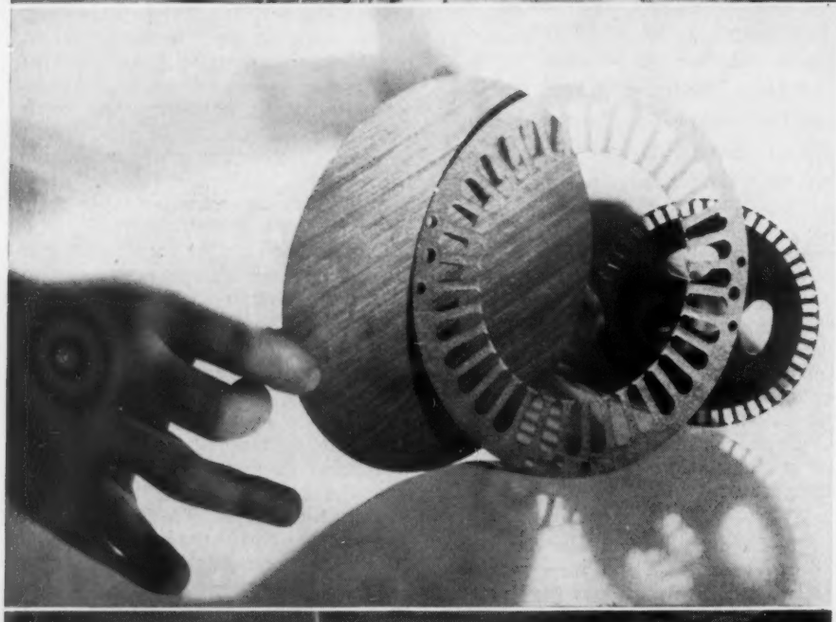
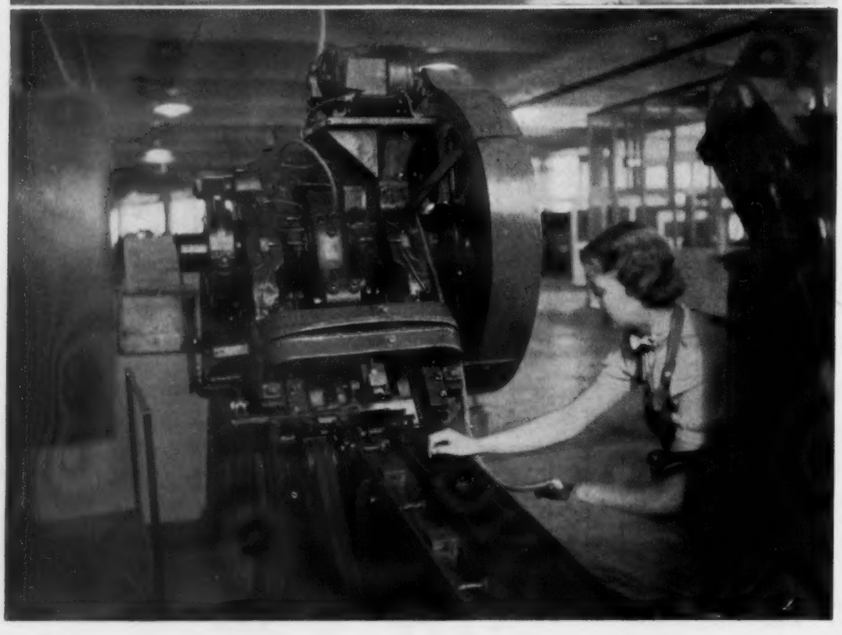


Fig. 6—Layout diagram showing the five conveyors with the nine presses and two stacking machines they serve







press at the front of each of the three process lines. Fig. 7 shows an operator placing a quantity of disks in the feed mechanism at one of these presses. All presses are inclined to permit automatic feed.

Rotor disks from this blanking press fall through the bed into a duct which leads to the rotor slotting press, the second machine in each of the three processing lines. This duct can be seen in the lower part of Fig. 7 and also in Fig. 10. Rotor disks are taken from this duct by an operator who loads the automatic feeding mechanism on the rotor slotting press as shown in Fig. 10. A bank of rotor disks is maintained at this stage to permit continuous operation during changing of dies at the blanking press.

Flexible Wiring System

Fig. 10 also shows the flexible wiring system employed at this plant where a number of machines are incorporated into a fabricating or processing lineup such as this. The principal element of this wiring system is a steel duct containing the power mains. This duct extends lengthwise the room at regular intervals. It permits connection of electric motors to a power source through flexible cables at any point in the floor area. This not only greatly simplifies wiring but makes it extremely easy to shift equipment around to permit the most advantageous arrangement.

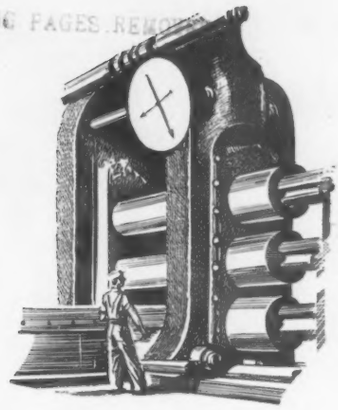
Thus wiring and accessibility to a power source is not a factor when considering changes in plant layout. In Fig. 10, two lengths of square steel ducts are visible mounted just below the structural steelwork forming the ceiling. From the steel ducts are seen the flexible cables leading to the individual motors on the presses.

From the blanking press in Fig. 7, stator laminations slide back through the press onto a belt conveyor shown in Fig. 9. This conveyor carries the doughnut shaped pieces to the stator slotting presses and delivers the pieces to a mechanism which automatically feeds the presses. After slotting, the stator core laminations fall on a 28-inch belt conveyor carrying them crosswise the end of the processing line as shown in Fig. 6 to an automatic stacking machine.

In a similar manner rotor core

Fig. 7 (Top)—Here disks are loaded into the automatic feed of a rotor blanking press. Fig. 8. (Center)—Showing disk from which the completed rotor and stator sections, also shown, are made. Fig. 9. (Bottom)—Stator blanks from the press in Fig. 7 fall through onto this conveyor which automatically feeds them into a stator notching press

ADVERTISING PAGES REMOVED



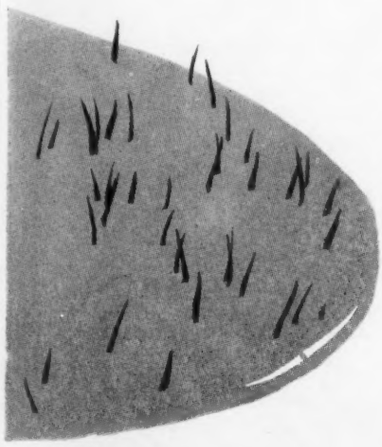
...BUT A 50% WASTE IN BEARING LUBRICATION wasn't discovered until we used Tycol Green Cast Grease

"Conditions in our mill involving heavy pressure and high temperature seemed too severe for the grease being used in our bearings. It thinned down and oozed out.

"We switched to Tycol Green Cast Grease. Bearings ordinarily packed twice a day, now require only one filling. The Tycol Grease resists separation better – and even under the most severe conditions gives complete satisfaction."

Like thousands of Tycol users, this operator gets more lubrication per pound of grease because Tycol Green Cast Greases have more high-grade paraffine base cylinder oil – less soap. They "stay put" even in worn bearings – result: a good film of protection. Tycol Green Cast Greases are made of a consistency to suit every need.

Why not search your plant for hidden losses resulting from poor lubrication? You may discover new operating economies. A Tide Water engineer will gladly help you make the survey. He will recommend the Tycol lubricant "engineered to fit your job."



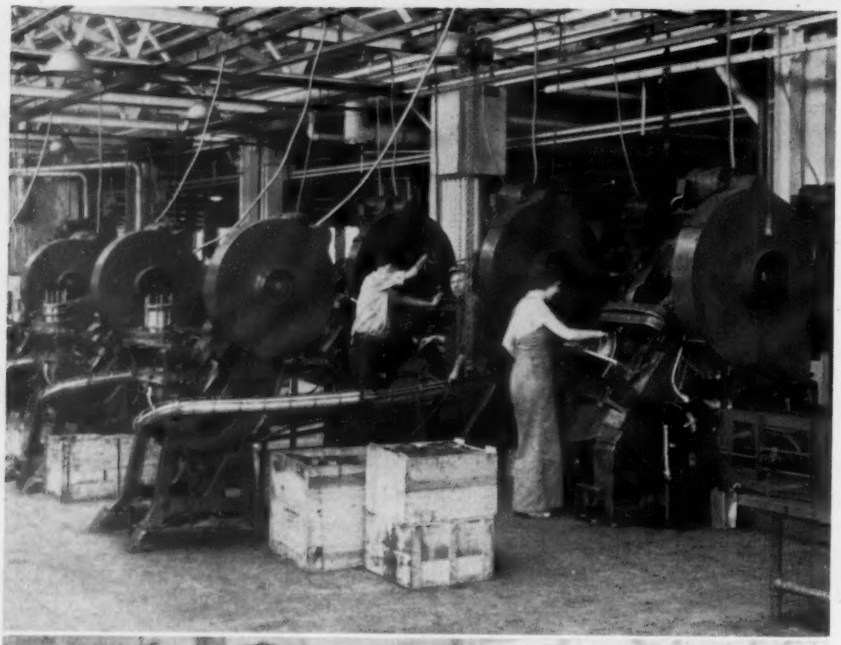
TIDE WATER ASSOCIATED OIL COMPANY

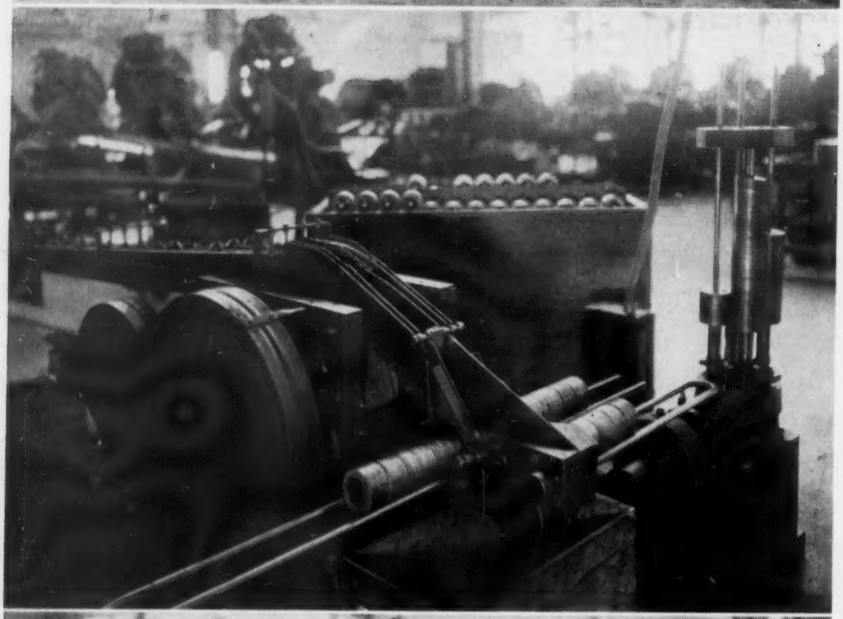
TIDE WATER DIVISION, 17 BATTERY PLACE

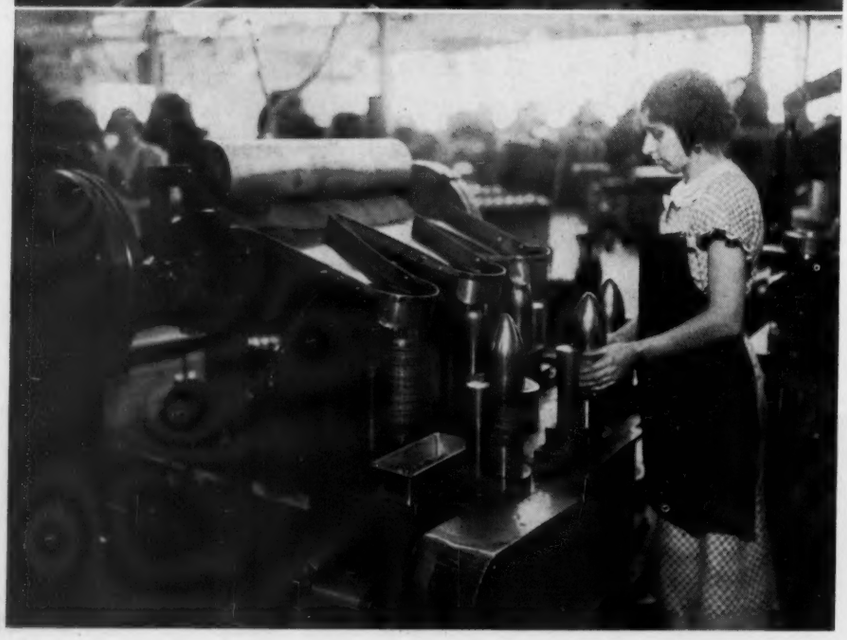
New York, N. Y.

GREEN CAST GREASES

SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE







punchings, after being slotted, fall onto a belt conveyor which also moves crosswise the three processing lines to an automatic stacking machine shown in Fig. 11. The delivery point of the stacking machine shown in Fig. 11 is continuously joggled or vibrated by a suitable mechanism to permit the wedge action of the lamination falling into the pack to expand it automatically. As the loading rack becomes full an operator removes the stacked pieces and loads them on a rod fixture such as that seen at the right in Fig. 11.

From this point the rotor laminations are placed in a machine, the rotor bars inserted, end rings fastened in place and the entire assembly riveted together. This is followed by welding the connector rings to the ends of the rotor bars which project through them. This forms a complete rotor ready to be assembled on its shaft.

Vibrating Stacking Pins

Stator laminations proceed from the delivery belt to the automatic stacking machine shown in Fig. 12. The stacking pins on this machine are vibrated to allow the laminations to form a stack as required. This machine also includes provision for shifting the position of the stacking pins quickly, permitting the operator to remove a complete stack from one set of pins while the other set is being loaded. Also, there is a guide on the belt arranged to feed the disks into any one of the three stacking pins. When a pin has been filled this mechanism can be shifted quickly to transfer the stream of disks to a second pin, permitting removal from the first pin without interference.

Highly mechanized equipment and layout such as the one described here, of course, are only possible where a tremendous volume of pieces are required, all of identical size and shape.

All of the cookie disks fed into this setup are 6 inches in diameter and either 0.017 or 0.025-inch in thickness. All slots in rotor and stator disks are pierced at one stroke of the press. Cookie disks are fed

(*Please turn to Page* 83)

Fig. 10. (Top)—General view of the setup. Rotor disks from the blanking presses at left are pressure fed through skeleton ducts to within easy reach of operators who load rotor notching presses. Fig. 11. (Center)—Closeup of the rotor stacking machine and the conveyor which feeds rotor laminations to this machine on edge. Fig. 12. (Bottom)—Operator removing a load of stator laminations from the automatic stacking machine fed by a 28-inch belt conveyor from the stator notching presses

DEPENDABILITY
PHILO
QUALITY • SERVICE
Ohio Ferro-Alloys Corporation
Canton, Ohio

A Plant Weldery

Methods by which one large fabricator organized an extremely successful welding department are detailed here. Two plant men, given course in welding, train welding operators, educate designers, etc. and show other plant men how to use welding most effectively

By H. THOMASSON
Welding Engineer
Canadian Westinghouse Co. Ltd.
Hamilton, Ont.

■ BY APPLYING arc welding to the construction of electrical equipment, it has been possible to increase reliability, capacity and structural strength. Welding has many well-known advantages. For maximum efficiency in use of welding, a number of elements are essential.

Regular procedure followed when an order is received or a proposition requested, is to submit the matter to the appropriate engineering division which makes up the electrical design, passing it on to the mechanical section for completion.

Upon receiving the electrical specifications, the mechanical department determines if a design exists that is suitable for the desired application. If not, it determines the general features, type of construction, which parts will be arc welded, etc. Then assembly and detail drawings are made.

Abstract from paper receiving second main award, $2,747.39, in Welderies classification of $200,000 Award Program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland, O., in which savings of $1,600,000.000 were shown available by wider application of arc welding.

Engineering Sheets Standardized

So all divisions may use the same basic forms and methods, Engineering Standard sheets have been developed to cover every possible phase of engineering and draughting activity with complete instructions necessary for uniformity of the drawings and information. Those which have a bearing on arc welded design comprise the calculation of working stresses, design rules and stresses for welding, methods for calculating weld stresses, fusion welding symbols, standards for welded joint design, form and areas for butt welds, strength of circular plates, data pertaining to the concentrated radial loading of rings, finish allowance tables for flat and rolled steel plates and sheets, formula for calculating bends in flat stocks and the method used to figure the size of material required to form a cone.

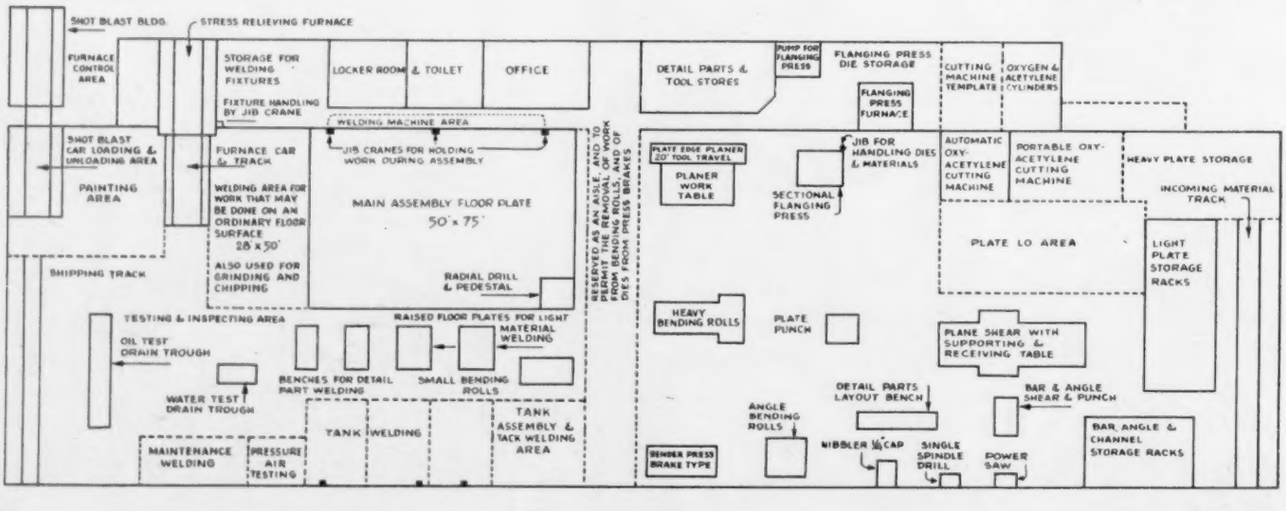
Engineering information is transmitted to the shop through process specification, order information and drawings. Each is complementary to the other and forms a part of a standard system.

The process specification forms a comprehensive detailed instruction for doing the work. On being approved, all departments likely to need them are given copies which are filed under the process specification number for future reference.

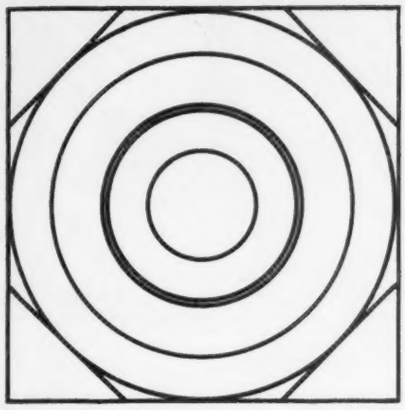
Whenever an order is received for a machine or part not regularly carried in stock, a stock order is issued and copies sent to every department that has work to do on it. This is indicated by the departmental designations immediately below the shipping date.

In making the drawing, every piece of material is given an item number and listed in the bill of material in the upper right hand cor-

Fig. 1—Plan showing shop floor layout and equipment locations


SHOT BLAST BLDG.
STRESS RELIEVING FURNACE
FURNACE CONTROL AREA
STORAGE FOR WELDING FIXTURES
LOCKER ROOM & TOILET
OFFICE
FIXTURE HANDLING BY JIB CRANE
DETAIL PARTS & TOOL STORES
PUMP FOR FLANGING PRESS
FLANGING PRESS DIE STORAGE
FLANGING PRESS FURNACE
CUTTING MACHINE TEMPLATE
OXYGEN & ACETYLENE CYLINDERS
WELDING MACHINE AREA
SHOT BLAST CAR LOADING & UNLOADING AREA
FURNACE CAR & TRACK
JIB CRANES FOR HOLDING WORK DURING ASSEMBLY
PLATE EDGE PLANER 20' TOOL TRAVEL
PLANER WORK TABLE
JIB FOR HANDLING DIES & MATERIALS
AUTOMATIC OXY-ACETYLENE CUTTING MACHINE
PORTABLE OXY-ACETYLENE CUTTING MACHINE
HEAVY PLATE STORAGE
INCOMING MATERIAL TRACK
PAINTING AREA
WELDING AREA FOR WORK THAT MAY BE DONE ON AN ORDINARY FLOOR SURFACE 28 x 50'
ALSO USED FOR GRINDING AND CHIPPING
MAIN ASSEMBLY FLOOR PLATE 50' x 75'
SECTIONAL FLANGING PRESS
PLATE LO AREA
LIGHT PLATE STORAGE RACKS
SHIPPING TRACK
RADIAL DRILL & PEDESTAL
RESERVED AS AN AISLE AND TO PERMIT THE REMOVAL OF WORK FROM BENDING ROLLS, AND OF DIES FROM PRESS BRAKES
TESTING & INSPECTING AREA
RAISED FLOOR PLATES FOR LIGHT MATERIAL WELDING
HEAVY BENDING ROLLS
PLATE PUNCH
PLANE SHEAR WITH SUPPORTING & RECEIVING TABLE
OIL TEST DRAIN TROUGH
BENCHES FOR DETAIL PART WELDING
SMALL BENDING ROLLS
WATER TEST DRAIN TROUGH
DETAIL PARTS LAYOUT BENCH
BAR & ANGLE SHEAR & PUNCH
ANGLE BENDING ROLLS
TANK WELDING
TANK ASSEMBLY & TACK WELDING AREA
NIBBLER ½" CAP
SINGLE SPINDLE DRILL
POWER SAW
BAR, ANGLE & CHANNEL STORAGE RACKS
MAINTENANCE WELDING
PRESSURE AIR TESTING
TENDER PRESS BRAKE TYPE

ADVERTISING PAGES REMOVED



METHOD OF CUTTING NESTED RINGS

Fig. 4—Layouts like this reduce material requirements

ner of the drawing where the name of the item, the material from which it will be made and all dimensions are recorded. Stock order information is a copy of the bill of material from each required drawing, but lists only the items required by the piece of apparatus involved. Thus a drawing with a hundred items may have only one called for, and that one only would be listed in the information from that drawing.

When a new drawing has been finally approved, copies are printed and turned in to the blue print depository. When a change is made in a drawing, it is given a new sub number. All new drawings are sub 1, and on the first change become sub 2. A messenger goes around to exchange the new copies for the old ones so no old drawing can remain in service.

Office Staff

The shop office staff consists of a welding engineer, a cost control man, a schedule man, an information clerk, a time keeper and an office junior. Supervisory staff on the shop floor includes a divisional foreman assisted by a welding inspector and two mechanical inspectors. Taking care of material and shipments is a combined receiver-storeman, and a shipper.

Equipment required by a department organized to produce machine parts by arc welded fabrication will vary to a large extent. The essentials are almost unbelievably small, consisting of a power saw and an oxyacetylene cutting outfit to cover preparing parts, with a set of bending rolls added if the product requires cylindrical parts.

Second portion of the work is accomplished to good advantage on a small floor or bench plate, the size of which is largely set by the dimensions of the parts to be built. A vertical plate is a worthwhile tool if box shaped parts are desired, while the addition of several husky C and floor clamps to the usual mechanic's tools of square, hand and sledge hammer, steel scales, chalk lines, etc., complete the requirements for a second portion minimum.

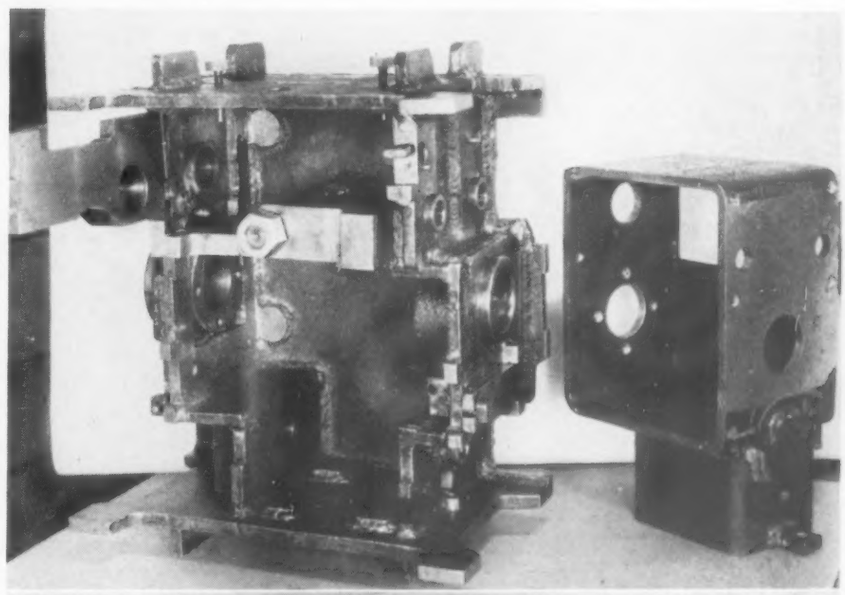
The third section, the actual arc welding, requires an arc welding direct current generator with its drive. This is specified because direct current will work well with any type of electrode in commercial use at the present time. Operator's protective equipment and hand tools consist of welder's helmet, gloves and leather arm protectors along with a hammer, chisel and wire brush.

The shop floor layout in Fig. 1 is based on producing fabricated parts. It is shown not exactly as it exists at present but as the author would have it, if such were possible.

Progressive Inspection

Here four inspections are made as the work progresses. First check is immediately after the layout. Second stage is after assembly and tack welding and before any arc welding is done. This insures that all assembly work is correct before finally fusing the parts together. Third stage is actual arc welding inspection, handled by the arc welding inspector only. This is a continuous procedure as welding progresses, the inspector examining the work as it is being done. Fourth and final inspection is made just prior to the shot-blast cleaning.

(*Please turn to Page* 82)



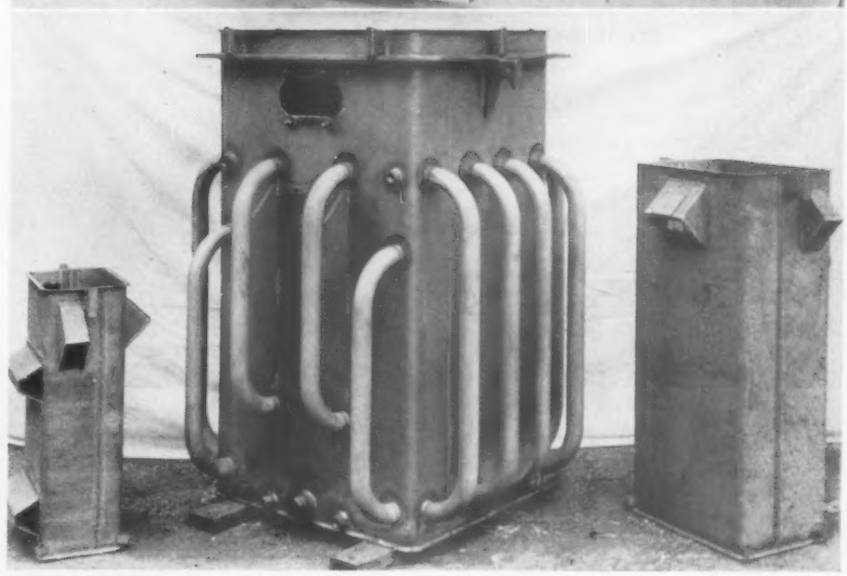
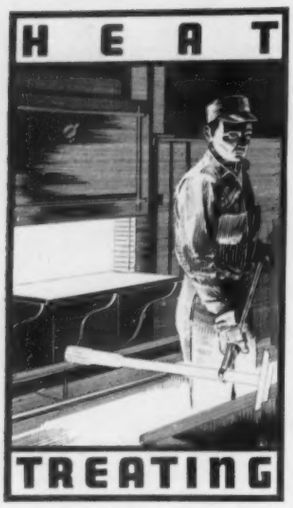


Fig. 2. (Upper)—Arc welded, box-type drill jig and frame it is used to drill. Fig. 3. (Lower)—Small welded steel transformer tanks



Valve Steels

Need for higher strengths and better resistance to oxidation in automotive engine exhaust valves spurs research and results in development of superior materials. Three groups of steels are now in general use, one being entirely new in the field

By A. T. COLWELL
Vice President
Thompson Products Inc.
Cleveland

DEVELOPMENT of new and better steels for use in aircraft and automotive engine valves has been going ahead quietly to the point where today a number of analyses have been perfected which appear to be "tailor-made" for the application. Summary of this research and attendant metallurgical data are presented in the accompanying article abstracted from a recent paper before the Indiana section, Society of Automotive Engineers.

■ AIRCRAFT exhaust valve steels of today have been fortified on working surfaces to the extent the steels simply are carriers for improvements. The valve shown in Fig. 1 affords an example. The base steel is a high chrome-nickel austenitic steel; the tip is high-carbon tool steel; the seat is puddled Stellite and the stem is nitrided; the cavity carries metallic sodium as a coolant. This seems a long way around to get a satisfactory valve, but these valves operate over 5000 hours without trouble, and such dependable operation is essential in aircraft.

These exhaust valves are all made up by the extrusion process. The grain flow of the extruded forging is ideal. Careful heat treatment and control of forging temperature are maintained to get proper grain size and structure.

This type of steel is subject to intergranular corrosion, and rigid control is necessary in its fabrication. Fig. 2 shows normal microstructure. Under certain conditions the sodium coolant will attack the interior of the valve, causing failure.

Aircraft engine builders have contributed greatly to improved valve performance. Good cylinder designs, steel seat inserts, bronze guides, forced and metered lubrication, excellent alignment and finish of all parts, and good cam design, have all helped.

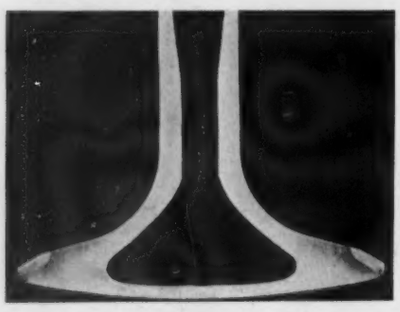


Fig. 1—Section of hollow-head aircraft valve with Stellite seat

Considering automotive valves for a moment, the problem is really more difficult than with aircraft valves. The aircraft engineer may use any means available to get dependable performance, but the automotive engine designer usually is working to a budget and hence is limited in valve design. Most design work is applied to adjacent parts, such as the seat insert, block cooling, exhaust passage, guide cooling, springs and the cam. Most actual valve work centers on material, and real progress is being made there.

For many years a standard automotive valve steel has been Silcrome No. 1. Some five years ago it became evident Silcrome was no longer good enough in some truck and bus motors, and this was also the danger signal for automobile engines. Research work was started to find a steel better than Silcrome, from the standpoints of strength and oxidation or corrosion resistance. In this study a large number of steel analyses were studied, falling into the two older groups of hardenable and nonhardenable (or austenitic); and a new group, about which we do not know too much as yet, but probably in the precipitation hardening group.

1. *The Hardening Group.* The hardenable group of steels can be made oxidation and corrosion resistant, can be tip hardened for tappet wear; is easy to machine and grind; has low coefficient of expansion; but this group is deficient in hot strength properties.

2. *The Austenitic Group.* The austenitic group can be given good oxidation and corrosion resistance, and has excellent hot strength; but it is more difficult to forge and machine; cannot be hardened; is subject to carbide precipitation; usually pits badly on the seat; and has a high coefficient of expansion.

3. *The Precipitation Hardening Group.* The precipitation hardening group can be given excellent oxidation and corrosion resistance; hard seat, stem and tip; good hot strength. Its coefficient of expansion is higher than Silcrome No. 1, but lower than the austenitic group. But it is difficult to forge and machine, and is low in impact value unless carefully handled.

Thus, any valve steel is a compromise, the steel being selected for

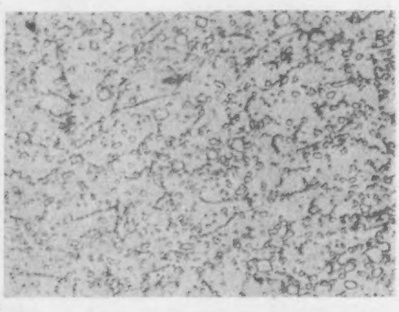


Fig. 2—Normal microstructure of aircraft valve steel. X 100

15-HOUR CYCLE for Annealing Malleable Castings

Short-Cycle Continuous Furnace installed in a mid-western manufacturing plant. Designed and built by Holcroft & Company, Detroit.

Lining: 9 in. of B & W K-26 Insulating Firebrick, backed up with 5 in. of B & W K-20; sprung arch, 9 in. of K-26. Dimensions of chamber: 53 ft. by 7½ ft. wide by 3¼ ft. high. Temperature zones vary from 1700 to 1250 F. Capacity: 20 tons in 24 hours. Fired with gas—40 radiant tubes and 15 cooling tubes.

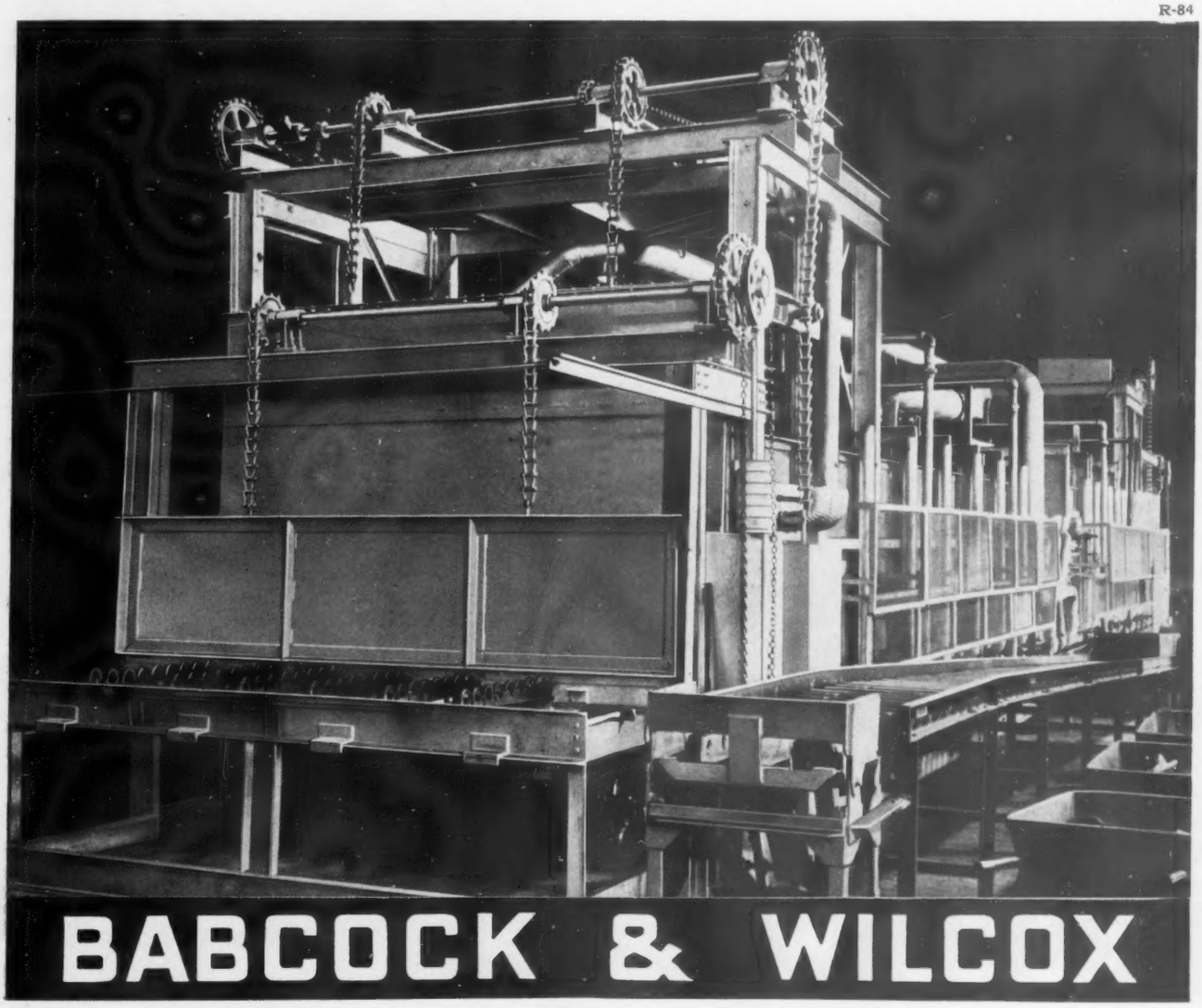
Work goes through this up-to-date furnace in only 15 hours—a remarkable short cycle.

One of the features promoting efficiency is the use of B&W Insulating Firebrick as furnace lining, which assures close temperature control and even heating of the work. Fuel consumption is reduced by reason of the ability to reach operating temperature quickly after a shut-down, and by low radiation loss.

B&W Insulating Firebrick are today saving money for the owners of practically every type of industrial furnace—write for Bulletin R-2-F, which contains technical data.

THE BABCOCK & WILCOX COMPANY
Refractories Division
19 Rector Street New York, N. Y.

R-84



BABCOCK & WILCOX

Fig. 3—Cracked valve head caused by too low forging temperature

are not recommended on this type of steel.

The price of the steel is comparable to Silcrome, thus giving a higher quality valve at approximately the same price. It is now used by Autocar, Buick, Buda, Chevrolet, Chrysler, Continental, Hudson, Graham-Paige, International Harvester and Pontiac.

Silcrome X-10 Steel. This is a low-priced, austenitic steel which excels Silcrome No. 1 in hot strength and impact value, hot hardness, corrosion and oxidation resistance. It cannot be hardened by heat treatment, but does mechanically harden to 45-50 scleroscope. For L-head engines, no additional tip is necessary, but for overhead engines a welded tip is recommended.

The coefficient of expansion is about 50 per cent greater than Silcrome No. 1. Cam design will dictate the added clearance necessary.

This steel is apt to show pitted seats and scuffed stems; but it generally has less defects after rolling than the hardenable steels. Valves of this steel deteriorate rapidly if held off the seat, but perform well when properly seated. It has no critical temperature, and hence the tendency to warp is minimized.

The steel is now used by Ford, Chrysler and White.

Silcrome XCR Steel. This is considered the best of the present automotive valve steels, but is more expensive than the other types listed. A glance at the analysis will indicate this. It has the ferritic property of hardenability, with the austenitic property of high strength at heat. It falls definitely into neither class. The analysis would indicate it is austenitic, yet it can be hardened with a 14 hour draw at 1450 degrees Fahr. We are not sure just what causes the hardening, but probably some forms of precipitation. It shrinks during hardening about 0.002-inch per inch of length. Valves must be carefully calculated for this reason, to locate retainer necks. Repeated heatings do not affect the steel appreciably. XCR maintains its hardness at heat remarkably well.

Valves made from XCR are hardened all over to scleroscope 48-58. The seat hardness is apparently beneficial.

Silcrome XCR has excellent corrosion and oxidation resistance, good hot strength. The hard seat and stem wear exceptionally well—in fact, the seats look more nearly like Stellite than any other valve material. The impact value is not high,

Table I

Analyses of Valve Steels

	Silcrome No. 1, per cent	Silcrome XB, per cent	Silcrome X10, per cent	Silcrome XCR, per cent
Carbon	0.40-0.50	0.60- 0.86	0.30- 0.45	0.40 - 0.50
Manganese	0.20-0.60	0.20- 0.60	0.80- 1.30	1.00 (max.)
Phosphorus	0.02 (max.)	.....	0.03 (max.)	0.035 (max.)
Sulphur	0.02 (max.)	.....	0.03 (max.)	0.035 (max.)
Silicon	3.00-3.50	1.25- 2.75	2.50- 3.25	1.00 (max.)
Chromium	8.00-9.00	19.00-23.00	17.50-20.50	23.25 -24.25
Nickel	.....	1.00- 2.00	7.00- 9.00	4.50 - 5.00
Molybdenum	.....	.....	.....	2.50 - 3.00

Table II

Physical Properties of Valve Seats

	Silcrome No. 1	Silcrome XB	Silcrome X-10	Silcrome XCR
	Ferritic hardenable	Ferritic hardenable	Austenitic, non-hardenable by heat treatment	Precipitation hardenable
Hot workability	Good	Good	Good	Fair
Hot extrusion	Good	Good	Fair	Fair
Machinability	Good	Good	Fair	Poor
Hot strength, pounds per square inch at 160 degrees Fahr.,*	4690	7625	17,500	20,000
Scalding temperature, degree Fahr.	1800	2150	2200	2200
Maximum hardness C Rockwell	56	50	45	50
Coefficient of expansion	0.0000078	0.0000078	0.000011	0.000009
Warpage	Poor	Good	Good	Excellent
Stainless properties	Fair	Excellent	Very good	Excellent
Corrosion resistance	Poor	Excellent	Fair	Excellent

* Hot strength is given by a slow pull, which is the proper method. The values are lower than often are quoted on Silcrome, but are accurate. All these values are much higher on a fast pull.

the qualities most needed in any particular job. Three steels practically have replaced all Silcrome No. 1. Analyses and physicals are shown in Tables I and II.

Silcrome XB Steel. This steel is of the ferritic, hardenable type and can be hardened to 65 plus, scleroscope, thus giving the hard tip which is desirable. Its strength at heat is appreciably higher than No. 1 Silcrome, but is lower than the austenitic steels. The critical temperature is lower than No. 1 Silcrome, which is undesirable, but all other properties are superior, and valves have so proved in actual test.

It has excellent corrosion and oxidation resistance, closely approximating the austenitic steels, wears well, gives good seat and stem performance, forges and machines easily. Maximum hardness is slightly under Silcrome No. 1.

The steel has the same coefficient of expansion as Silcrome and therefore can use the same tappet and guide clearance. Valve seat inserts

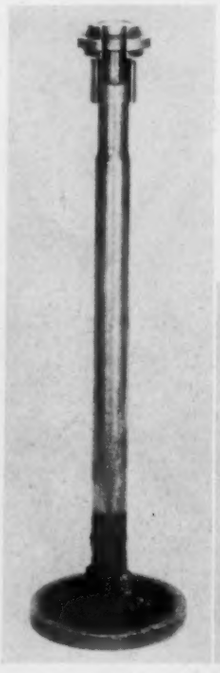
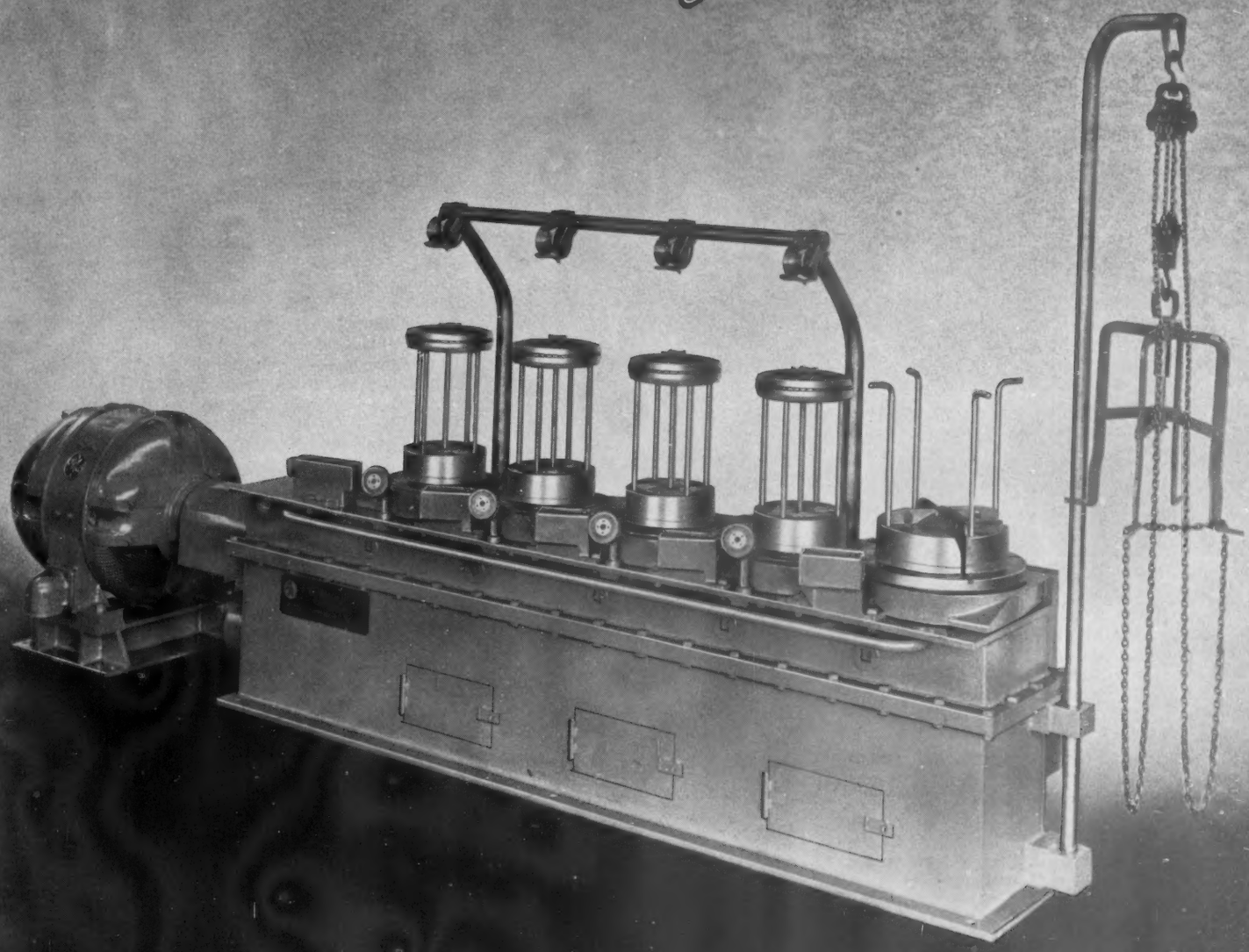


Fig. 4 (left)—Valve spring cap which permits rotation of the valve. Fig. 5 (below)—Condition of valve seats: Left, valve rotating; right, valve not rotating

AETNA GROUP DRIVEN

Wire Drawing Machine



MAXIMUM EFFICIENCY • MINIMUM UPKEEP

Among Important Features Are:

❶ Overhead take-off, which reduces threading time. ❷ Rigid die boxes, which facilitate rapid and accurate casting.

❸ Unusually effective system of water cooling, which has the effect of increasing die life, finishing speed and torsion test.

THE **AETNA-STANDARD** ENGINEERING COMPANY

CONSULTANTS—DESIGNERS AND BUILDERS TO THE STEEL AND NON-FERROUS INDUSTRIES

YOUNGSTOWN, · OHIO, · U. S. A.

ASSOCIATED COMPANIES

Head, Wrightson & Co. Limited, Thornaby-on-Tees, England. Aktiebolaget Arboga Mekaniska Verkstad, Arboga, Sweden.

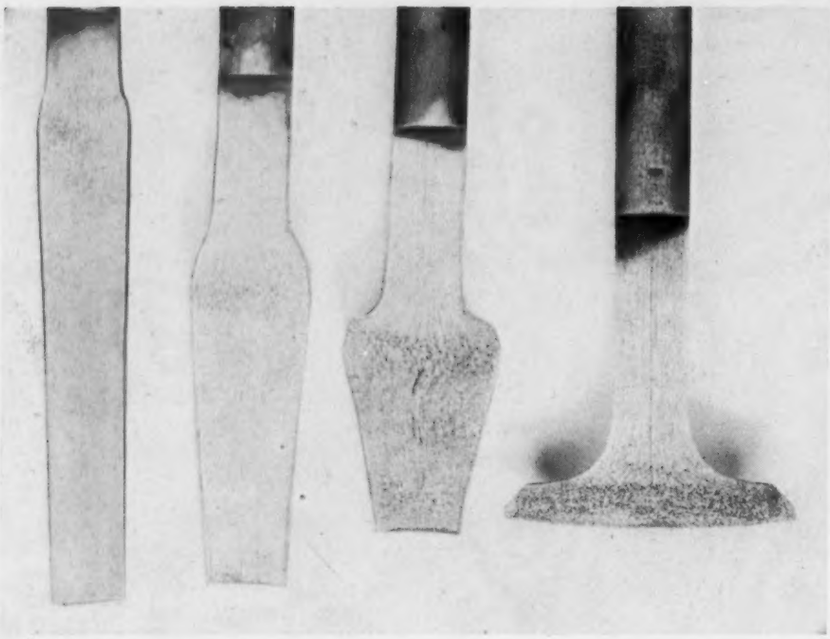


Fig. 6—Grain flow in valves made by gather-upset process

being considerably under that of Silcrome No. 1 and Silcrome XB, and far below the austenitics; the steel therefore must be handled carefully, both at the mill and in manufacture. The low carbon type gives best hardness, but the higher carbon gives better impact value Scale is tightly adherent.

Inasmuch as this is a new type of steel as used for valves, there are some interesting points connected with its development. Its hardenability was discovered by accident. A bar happened to be left on the hearth of a furnace for a long time. A workman later tried to cut it, but being unable to do so, reported to his metallurgist that the steel was hard—it would not cut. The metallurgist replied the steel could not be hardened. The workman replied, "Perhaps not, but here it is—hard;" —and it was.

The steel must be forged within a 25-degree range—if overheated, it loses the ability to harden; if forged too cold, it tends to shatter. Fig. 3 illustrates an example of shattering in a valve forging caused by forging at too low temperatures. The analysis and treatment must be watched carefully to give proper impact value. Although hard, it is difficult to grind. It is magnetic when soft and nonmagnetic when hard.

The steel has been adopted by Allis-Chalmers, Autocar, Chrysler, International Harvester, Oldsmobile and Sterling Engine, and has been approved by several others.

Rotating Valves. Some time ago the Ethyl Gasoline Corp. ran a test on a controlled, slowly rotating valve. The result was particularly good. We repeated these tests, and got good results. A device has been developed which causes the valve to rotate slowly, which is shown in Fig. 4. Its design is such that the retainer cap is slightly longer than the valve stem; hence when the tappet makes contact, the spring is compressed before the valve starts to lift, and the valve is then entirely free, and takes a slowly turning motion from the tappet. Fig. 5 shows the result of a test with and without the device. Tests indicate the rotating valve has a definitely better seat, but works best with a hard seat valve, such as XCR or the Stellited aerotype.

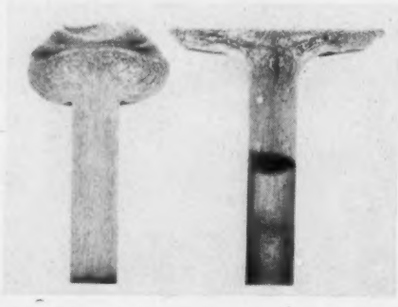


Fig. 7—Grain flow in valves made by electric upset process

Grain flow in valve forgings is an interesting study. Figs. 6, 7 and 8 show, respectively, three methods of making valves: gather-upset, electrical upset, and extrusion. Satisfactory valves can be made by all of these methods, but Thompson engineers favor the extrusion process for exhaust valves and the electrical upset method for intake valves. Grain flow is more uniform in the extrusion sample.

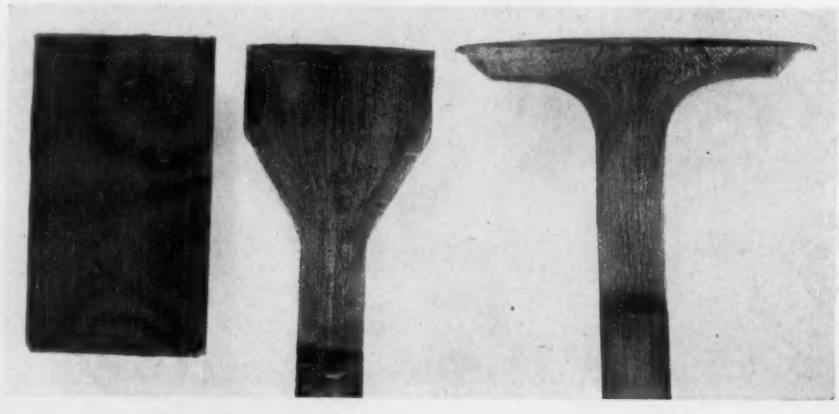
Special furnaces are used for forging and heat treating, for experience has taught the important factors to be controlled in producing a good valve forging. One such factor is the system of preheating, followed by soaking of the piece to be forged, time and temperatures being accurately controlled.

Surface treatment of the parts such as valves is receiving emphasis among the various manufacturers because it has been demonstrated that extremely beneficial results can be obtained by surface treatment. The Perfect Circle Co., Hagerstown, Ind., for one has been active in this work for the past two years, originating the Ferrox treatment, an oxide treatment at high temperatures.

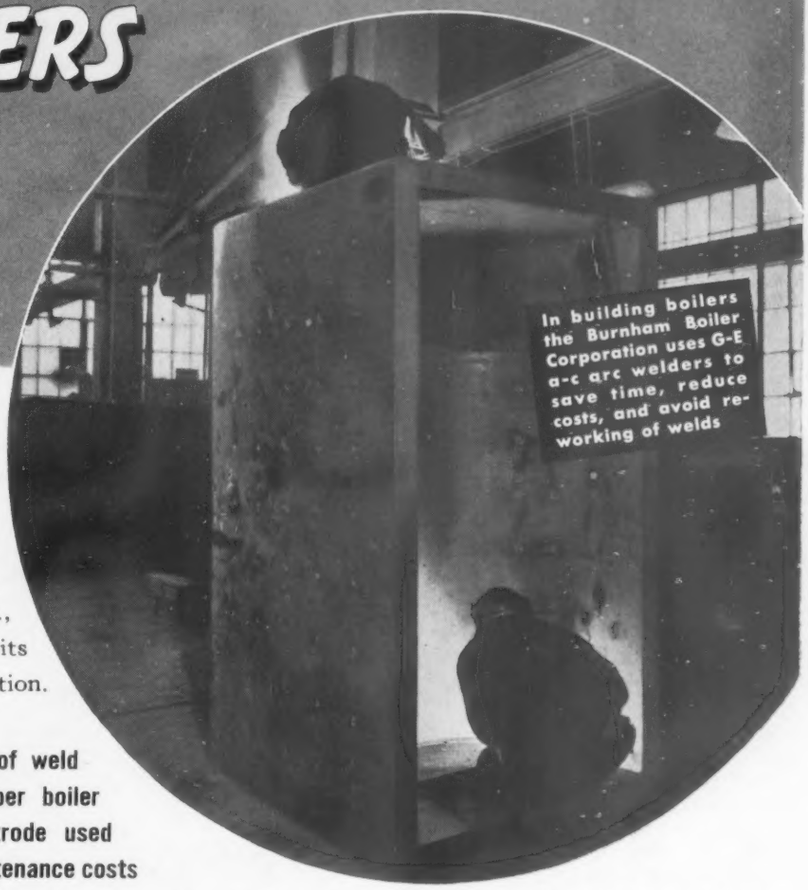
The Standard Oil Co. of California has developed the Feritex process which also gives a surface treatment, but in a somewhat different manner. Feritex is an etching process giving a sulphide surface.

In general, the treated surface alters the gummy or soft ferrite so that it does not tend to weld or pick up on the rubbing part. The oxide or sulphide also acts as a fine rouge in bringing the moving part to a seat, and prevents the usual high rate of wear while fizz is being worn from the parts. The possibilities of this type of treatment are just being realized.

Fig. 8—Grain flow in valves made by the extrusion process



CHANGE TO GENERAL ELECTRIC A-C WELDERS PAYS BIG DIVIDENDS


In building boilers the Burnham Boiler Corporation uses G-E a-c arc welders to save time, reduce costs, and avoid reworking of welds

At Burnham Boiler Corporation

SOME time ago, the Burnham Boiler Corporation replaced the direct-current arc welders at its Geneva, N. Y., Division with G-E alternating-current units and changed its methods of plant operation. Here are the results it obtained:

75-per-cent reduction in cost per foot of weld
60-per-cent reduction in welding time per boiler
35-per-cent reduction in welding electrode used
70-per-cent reduction in power and maintenance costs

Eight months after the installation, this company found that the benefits had already paid for the new equipment. Many other manufacturers whose production work involves shop welding of mild steel are finding that G-E alternating-current welders are real money makers.

INSULATED WITH FLEXIBLE GLASS

Spun glass—one of the best insulating materials developed by modern research—is used in insulating G-E arc-welding transformers. To prevent burnouts and overheating, tightly woven, heatproof, fiber-glass tape is wound over each coil. G-E alternating-current arc welders are built in 150-, 300-, 500-, 750-, and 1000-ampere sizes.

Why not call the nearest G-E arc-welding distributor or sales office to help you determine how you can use G-E alternating-current arc welders to advantage? Or send the coupon to General Electric Company, Schenectady, N. Y.

General Electric
Dept. 6E-201, Schenectady, N. Y.

☐ *Please send me Bulletin GEA-1750, on a-c welding.*

☐ *Can I use a-c welders to advantage in my work? (Attach description of work.)*

NAME .....

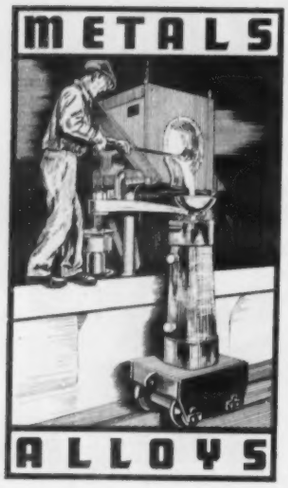
FIRM .....

STREET .....

CITY ..... *STATE* .....

140-86

GENERAL ELECTRIC



Oil Well Bits

Called upon to give unfailing operation under severe conditions of abrasion and strain, bits for drilling oil wells must combine high surface hardness or abrasion resistance with maximum toughness. Certain new alloys produce good results in such service

By **NOLAN J. CLARK**
Asst. Chief Metallurgist
Reed Roller Bit Co.
Houston, Tex.

■ THREE MILES straight down on a slender stem of steel is a small unit grinding away. This bit must penetrate material varying widely in physical properties. Quartz, limestone, sandstone, pyrites and gypsum are some of the rocks and minerals encountered, as well as complex ore bodies.

Churn type drills were used in the first oil fields in the East. With the increasing demand for petroleum, the rotary drill was developed with a fish tail bit made from forged steel, and from this evolved the modern rock bit used on a similar drill stem. At present, practically all oil prospecting is done with rotary drilling tools. The softer formations, clay, shale and some soft rock, can be cut to advantage with fish tail bits but harder formations require bits which do not take so much shock and which will sand higher pressures than the fish tail. To meet this demand, the rotary rock bit has been developed.

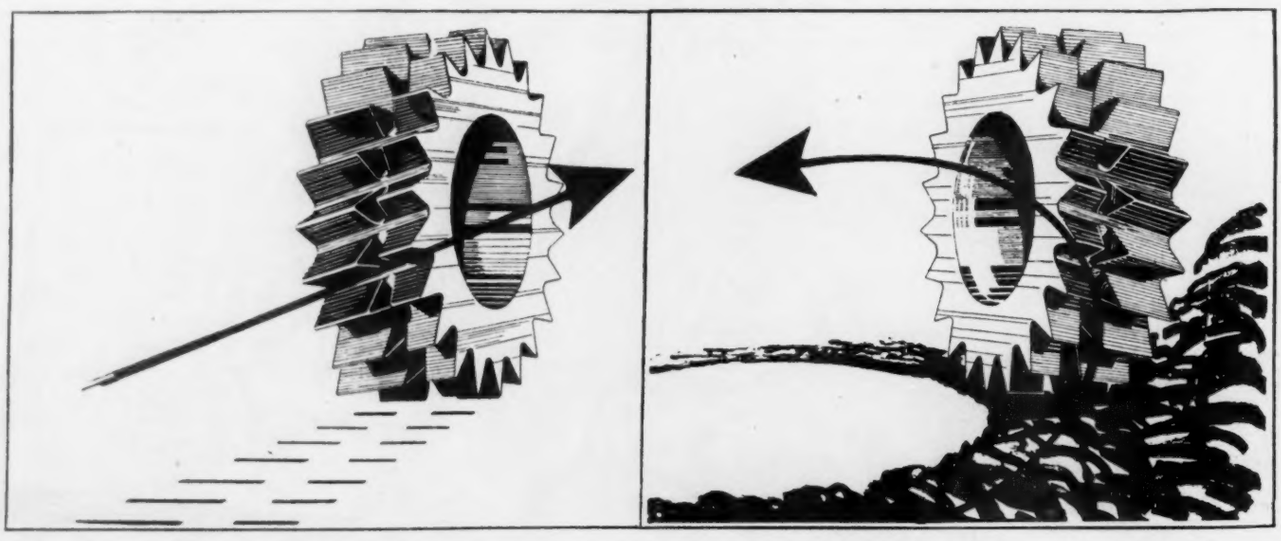
This bit, making use of the same scraping action as the fish tail, combines other actions which permit the cutting edges to be multiplied by a number of teeth on a cylindrical or tapered cutter. See Figs. 1 and 2. The cutter is free to turn on its axis and thereby relieves to some extent the strain that each cutting edge is called upon to bear.

At the same time the teeth are pressed down in the formation, resulting in high abrasion of the cutting surfaces of each bit. This abrasive action calls for the hardest of materials to withstand the attack. The first roller type bits were made of carburized steel to get maximum surface hardness backed by a tough core. This combination of properties, maximum hardness or abrasion resistance and maximum toughness, is different to produce in steel. While carburized steel to some extent met these problems, research now has developed harder and more abrasion resisting materials.

Welding harder metals on the surface presented a method of increasing the wear resistance and a number of combinations of alloys were used over a period of time. Manganese, chromium molybdenum, cobalt and tungsten were favorite alloying elements for these surfacing materials. Carbides, borides

Abstract from "Foote-Prints" published by Foote Mineral Co., Philadelphia.

Fig. 1. (Left)—When rolled in a straight line, cutter does not tear the surface. Fig. 2. (Right)—When forced to take a circular path, however, the teeth twist and tear the formation they penetrate. This is the action of the roller bit shown in Fig. 3 when drilling



and nitrides all offered some promise. Difficulty was experienced in making welded surfaces of most of these alloys that would have uniform properties.

Work done in European countries and finally in this country led to the development of cemented tungsten carbides bonded by a tough material such as cobalt. This indicated the possibility of using the hard, brittle carbide of tungsten in a tough binder which would have some of the properties of each. The process of making these cemented carbides is quite expensive and their attachment to cutting tools can be accomplished only by brazing. For these reasons, their use in oil well tools has been quite limited.

Tungsten Carbide On Bits

Ultimately, fine grain tungsten carbide powder was applied directly to the cutting surfaces of bits. This was first accomplished by puddling-up the base metal of the bit with a carbon arc so it surrounded the tungsten carbide particles, thus producing a surface containing a large number of small particles of tungsten carbide. A number of other methods have been developed for accomplishing the same result. It has been found by judicious additions to the steel and regulating the methods of heating that the over-all properties of the hard-face overlay may be controlled to a certain extent. Tungsten carbide of various grain sizes can now be applied by either electric arc or torch methods of welding. In all cases the overlay consists of a matrix of some ferrous alloys, either sweated-up from the base metal or added in the form of a thin-wall tube which is filled with carbide particles and which is melted down around the grains.

Making Tungsten Carbide

Tungsten carbide is made from tungsten powder and carbon in an electric furnace and consists of a mixture of several carbides of tungsten. Economical methods of making it have been developed to yield a fine grain metal with maximum ductility. A cast button of the material is crushed to a screen size best suited for the purpose, producing sharp edged, irregular grains. The steel binder used to cement the grains to the base metal, alloys with the carbide to such an extent that a strong bond results.

By the above methods, tungsten carbide can be applied to all surfaces of rock bits used to drill hard formations. Even the old fish tail bit has been rebuilt to take tungsten carbide. The same granular carbides find a great use on the faces of these bits and a certain reinforcing of the cutting edge is accomplished by inserted tungsten carbide "fingers" extending downward from the cutting edge. The effect of these on drilling can be clearly seen in the fingering wear shown in accompanying illustrations.

The cuttings made by all bits in the rotary class are removed from the hole by forcing an aqueous fluid down the hollow drill stem and up the outside between the drill stem and the wall of the hole. This fluid carries a great amount of slush which is often quite abrasive. Tungsten carbide and alloys containing them have been used to advantage where this slush causes severe wear in restricted areas such as the slush tubes in bits.

It is possible to cast tungsten carbide in tubes or liners of a wide variety of shapes. Many of these special shapes are made from tungsten carbides that have some metal such as cobalt added for the purpose of decreasing their brittleness. This, however, lowers the overall hardness.

Fig. 3—Rock bit cutters as used in a typical roller bit showing location of welded tungsten carbide on the faces of the teeth

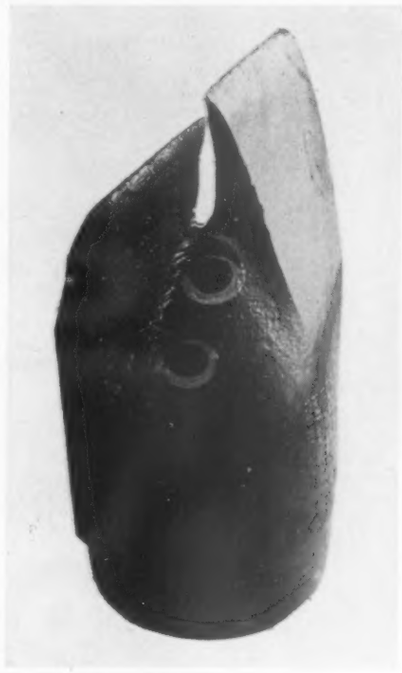


Fig. 4—A fishtail bit with tungsten carbide inserts before being used

Fig. 5—The same bit will look like this after being worn in service. The carbide inserts cause the "fingering" action shown here

♦

Automotive Construction From French Viewpoint

■ *Automobile*, by Georges Mohr; fabrikoid, 531 pages, 3¾ x 5¾ inches; published by Dunod, Paris, France; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S. W. 1.

This French volume is a compendium of information for automobile engineers and others associated with the industry. The volume is pocket size, divided into three main divisions, of which the first is concerned with formulas for study and construction of motors and automobiles and contains summaries on mathematics, physics, mechanics, chemistry, etc. The second section is devoted to automobile construction materials. The third deals with motors, clutches, gear shifts, transmissions, differentials, brakes, etc.

Foundrymen Announce Program for Annual Convention in Cincinnati

■ AN ELABORATE program of sessions, dinners and special features has been arranged for the forty-third annual convention of the American Foundrymen's association at Hotel Gibson, Cincinnati, May 15-18. Technical sessions offer a wide range of papers and committee reports on steel, gray iron, malleable and nonferrous foundry practice; refractories; sand research; patternmaking; foreman and apprentice training; public relations; safety and hygiene; time study; and costs.

Among special features will be the annual business meeting and board of awards lecture on May 17; the annual dinner and medal awards on the evening of the same day; a course of three lectures on cast iron metallurgy; the usual shop operation course; and numerous plant visitations. No exhibition will be held this year.

Details of the convention sessions are as follows:

Monday, May 15

MORNING

Opening Session

Address of welcome.

President's address, by Marshall Post, vice president and works manager, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Malleable Cast Iron

"Atmospheres for Malleable Iron Annealing—Their Properties and Applications," by John Dow, Holcraft & Co., Detroit.

"White Iron for Malleablizing," by J. O. Klein, Texas Foundries Inc., Lufkin, Tex.

"Shearing of Malleable Iron Gates," by S. D. Martin, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich.

Nonferrous

"Production of Bronze Pressure Castings," by D. Frank O'Connor, Walworth Co., Boston.

"Crucible Melting," by G. K. Eggleston, Detroit Lubricator Co., Detroit.

Gray Iron Shop Course

Session 1—"Cupola Practice." Discussion leader: Donald J. Reese, International Nickel Co. Inc., New York.

AFTERNOON

Plant Visitation

Cincinnati Milling Machine Co.

EVENING

Malleable

Dinner and roundtable conference. Discussion on current practices.

Materials Handling

"Mold Equipment," by W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa.

"Some Tests on Effectiveness of Water Under High Pressure for Cleaning Castings," by R. Webster, Hydroblast Co., Chicago.

Nonferrous

"Effects of Aluminum and Antimony on Physical Properties of Red Cast Brass (85-5-5-5)," by H. B. Gardner and C. M. Saeger Jr., national bureau of standards, Washington.

"High-Conductivity Copper Castings," by A. B. Kinzel, Union Carbide & Carbon Research Laboratories, New York.

Annual business meeting of nonferrous division.

Lecture Course

Session 1—"The Microscope in Elementary Cast Iron Metallurgy," by R. M. Allen, metallurgical consultant, Bloomfield, N. J.

Tuesday, May 16

MORNING

Gray Iron Shop Course

Session 2—"Production of Uniform Dense Structures in High Test and Alloy Iron Castings," by M. A. Scott, Greenlee Foundry Co., Chicago.

Malleable

"Effects of Manganese on Second Stage Graphitization," by D. P. Forbes, Gunite Foundries, Rockford, Ill.

"Hydrogen in Solid White Cast Iron," by H. A. Schwartz and G. M. Guiler, National Malleable & Steel Castings Co., Cleveland.

Gray Cast Iron

"A Scientific Approach to a Foundry Problem," by L. A. Danse, Cadillac Motor Car Co., Detroit.

"60,000-Pound Cupola Iron," by E. L. Roth, Motor Casting Co., Milwaukee.

"Castings for the British Gas Industry," by F. Whitehouse, Newton, Chambers & Co. Ltd., Chapeltown, England. Exchange paper of Institute of British Foundrymen.

Nonferrous

"The Foundry and Metallurgical Science," by M. G. Corson, New York.

"Influence of Pouring Ladles on Quality of Red Brass," by R. W. Parsons, Ohio Brass Co., Mansfield, O.

Apprentice Training

"Apprentice Training," by Herman K. Ewig, Cincinnati Milling Machine Co., Cincinnati.

"Foundry Apprenticeship," by M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

NOON

Nonferrous

Luncheon and roundtable meeting.

AFTERNOON

Safety and Hygiene

"Establishment of a Safety and Hygiene Program in a Small Foundry," by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, O.

"The Open House and Public Relations," by W. H. Doerfner, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich.

Castability of Metals

"Castability of Cast Steel," by C. H. Lorig and E. C. Kron, Battelle Memorial institute, Columbus, O.

"Effects of Superheating on Castability and Physical Properties of Gray Iron," by N. A. Ziegler and H. W. Northrup, Crane Co., Chicago.

"Measurement of the Fluidity of Aluminum Alloys," by L. W. Eastwood, Aluminum Co. of America, Cleveland.

"Malleable Iron Castability Tests," by E. J. Ash, University of Michigan, Ann Arbor, Mich.

Lecture Course

Session 2—"The Microscope in Elementary Cast Iron Metallurgy," by R. M. Allen, metallurgical consultant, Bloomfield, N. J.

EVENING

Engineering Instructors

Dinner meeting.

Refractories

"Plastic Cupola Patching," by R. E. Wilke, John Deere Tractor Co., Waterloo, Iowa.

"Refractories in the Steel Foundry," by A. V. Leun, Bethlehem Steel Co., Bethlehem, Pa.

Time Study

"Practical Approach to Motion and Time Study," by G. J. Stegemerten, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Wednesday, May 17

MORNING

Gray Iron Shop Course

Session 3—"Cupola Refractories and Figuring Mixes," Discussion leader: J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

Gray Iron

"Rapid Temperature Measurements of Cast Iron with an Immersion Thermocouple," by F. Holtby, University of Minnesota, Minneapolis.

"Copper-Aluminum-Silicon Alloy Additions to Cast Iron," by V. H. Schnee and T. Barlow, Battelle Memorial institute, Columbus, O.

"Influence of Undercooling on the Graphite Pattern of Gray Iron," by R. Schneidewind and C. D'Amico, University of Michigan, Ann Arbor, Mich.

Foreman and Apprentice Training

"Foundry Apprentice Training—An Essential to Foreman Training," by A. P. Luebke, Fairbanks, Morse & Co., Beloit, Wis.

"A Foundrymen's Approach to Foreman Training," by W. G. Conner Jr., Walworth Co., Greensburg, Pa.

Steel

"High Alloy Steel Castings for Heat and Corrosion Resistance," by James Corfield, Michigan Steel Castings Co., Detroit.

Report of committee on impact tests.

Report of committee on radiography.

"Gamma Ray Radiographic Standards of U. S. Navy for Steel Castings for Pressure Service," by N. A. Kahn, New York navy yard.

"Copper as an Alloying Element in Some Cast Steels," by C. T. Greenidge and C. H. Lorig, Battelle Memorial institute, Columbus, O.

Sand Research

"Properties of Resin Bonded Cores," by Emile Pragoff Jr., Hercules Powder Co., Wilmington, Del.

"Hot Strength and Collapsibility of Foundry Sands," by H. W. Dietert and E. E. Woodliff, Harry W. Dietert Co., Detroit.

Annual Business Meeting

Election of officers.

Committee reports.

Board of awards lecture.

AFTERNOON

Steel

"A Rapid Method for Determining Carbon in Plain Carbon Steels for Control Purposes," by H. H. Blosjo, Minneapolis Electric Steel Foundry, Minneapolis.

"A Discussion on Steel Castings Having High Mechanical Properties," by George Delbart, Societe Francaise de

Constructions Mecaniques, Paris, France. Exchange paper of Association Technique de Fonderie De France.
Report of committee on heat treatment.
"Synthetic Bonded Steel Molding Sands," by C. W. Briggs, Steel Founders' Society of America, Cleveland, and R. E. Morey, naval research laboratories, Anacostia, D. C.
Report of committee on coupon tests.

Sand Research

"Elements of Petrographic Study of Molding Sands," by R. E. Grim, Illinois geological survey, Urbana, Ill.
"Mineral Composition and Textures of the Clay Grade of Molding Sand," by C. E. Schubert, University of Illinois, Urbana, Ill., and R. E. Grim, Illinois geological survey, Urbana, Ill.
Report of sand research committee.

Foundry Costs

"Molding Costs," a committee report.
"Melting Costs," a committee report.

Lecture Course

Session 3—"The Microscope in Elementary Cast Iron Metallurgy," by R. M. Allen, metallurgical consultant, Bloomfield, N. J.

EVENING

Annual Dinner

Presentation of medal awards. (See STEEL, April 10, p. 22.)
Address.

Thursday, May 18

MORNING

Gray Iron Shop Course

Session 4—"Cupola Operation," by John Lowe, Lansing, Mich.

Steel—Symposium on Melting Practices

"Acid Electric," by W. G. Finster, Reading Steel Castings division, American Chain & Cable Co., Reading, Pa.
"Basic Electric," by C. W. Briggs, Steel Founders' Society of America, Cleveland.
"Basic Open Hearth," by J. W. Porter, American Steel Foundries, East Chicago, Ind.
"Acid Open Hearth," by W. C. Harris, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
"Converter," by F. B. Skeates, Link-Belt Co., Chicago.
"Induction Furnaces," by G. F. Landgraf, Lebanon Steel Foundry, Lebanon, Pa.

Gray Iron

"Influence of Composition on Physical Properties of Gray Iron," by R. G. McElwee, Vanadium Corp. of America, Detroit, and R. Schneidewind, University of Michigan, Ann Arbor, Mich.
"Some Factors in Hardening and Tempering Gray Cast Iron," by V. A. Crosby, G. A. Timmons and A. J. Herzig, Climax Molybdenum Co., Detroit.
"Effects of Heat Treatment on Combined Carbon and Physical Properties of Cast Iron," by S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago.

Pattern Making

"Some Pattern Making Problems," by J. A. Kolb, Caterpillar Tractor Co., Peoria, Ill.

NOON

Gray Iron

Gray iron division luncheon.

Steel

Steel division luncheon and roundtable. Discussion topics: "Deoxidizers;" "Reduction of Silicon from Slag."

AFTERNOON

Plant Visitation

Hamilton Coke & Iron division, American Rolling Mill Co., Hamilton, O.

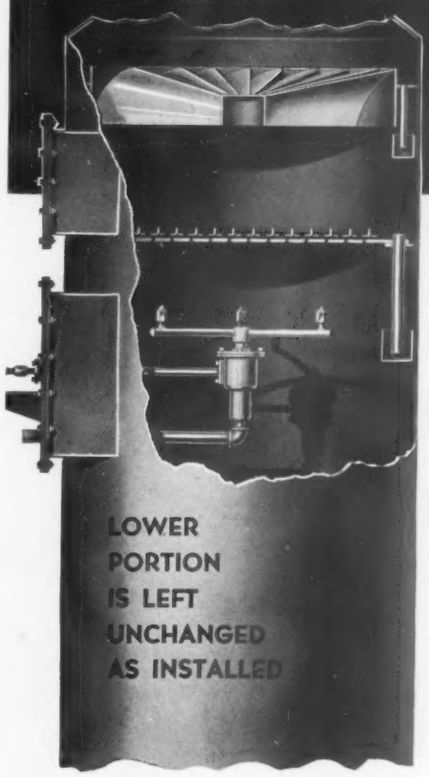
Strength of Tin Affected by Antimony

■ A new publication, A-78, of International Tin Research and Development council treats mechanical properties of alloys of tin with from 2 to 18 per cent of antimony.

In chill-cast, rolled strip and extruded wire specimens it was found that little improvement was obtained by using more than 9 per cent of antimony. Progressive amounts of cold-work on the hardness was studied in the case of three alloys containing 4.5, 7 and 14 per cent of antimony and it was found that, in the case of the first two, reduction of from 10 to 30 per cent caused a permanent hardening. The 14 per cent alloy was considerably harder as chill-cast but was not hardened by mild reduction and on the contrary was softened by severe reduction although there was a slight recovery with time. On annealing after reduction there was with all the alloys a recovery of hardness to values near those of the chill-cast specimens, showing definitely the value of annealing.

Copies may be obtained from International Tin Research Development council, 149 Broadway, New York.

Clean-Dry BLAST FURNACE GAS



from your PRESENT Scrubbers

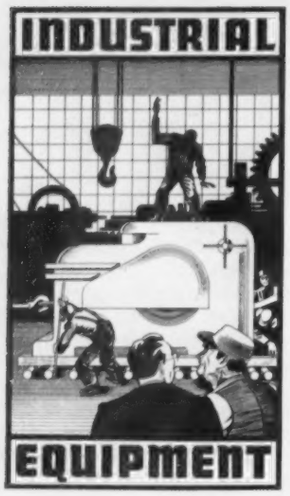
Existing cooling and scrubbing towers can be made into truly efficient washers by installing PEABODY TRIPLE ACTION cleaning and drying units near the gas outlet. Nothing needs be disturbed in the general arrangement below. Cleaning can be provided for any required volume of gas, with operation amazingly economical.

Coal, limestone dust, coke breeze, fume and other impurities are definitely removed, leaving gas suitable for any desired purpose. We invite your inquiry for improving the efficiency of installed equipment.

PEABODY also builds complete scrubbing units from the ground up. See Bulletin H-101.

PEABODY Bulletin H-201 Describes the Triple Action Scrubber Fully. Send for a Copy.

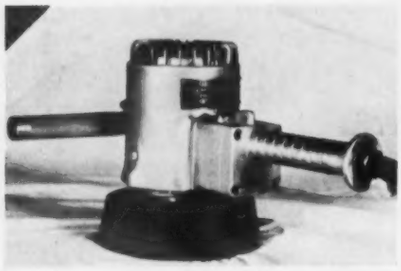
PEABODY ENGINEERING CORPORATION
580 Fifth Avenue, New York
OFFICES IN PRINCIPAL CITIES



New Type of Motor Drives Portable Grinder

■ Gaston Power Tools, Evergreen Park, Ill., has placed on the market a new type portable grinder which is said to cut fast and leave a smooth path even when coarse grinding wheels are used.

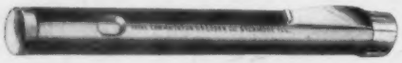
Grinder has two bearings and no gears. Motor develops a maximum



of 2 horsepower, has no brushes and winding is enclosed in dust-tight case. Weight of grinder is only 15 pounds, but it will drive a 7-inch disk grinding wheel at speed of 3400 revolutions per minute. Unit is designed to operate directly from regular 220 volt, 3 phase 60 cycle power circuit.

High Voltage Indicator Utilizes Static Field

■ Ideal Commutator Dresser Co., Sycamore, Ill., has developed an extremely sensitive, pocket type, high-voltage indicator. A glow tube lights when indicator is held in a changing static field such as is found surrounding belting, high fre-



quency and X-ray equipment, alternating current circuits, pulsating direct currents, condenser discharges, automobile ignition, etc. It is not necessary to touch conductor. Device positively indicates presence of voltages of 2000 and over at several times flash-over distance from a noninsulated conductor. Case is hard rubber, fitted with pocket clip. Indicator takes no more space than a fountain pen.

Develops Spindle Speed Preselector for Lathes

■ Bardons & Oliver Inc., 1133 West Ninth street, Cleveland, recently introduced a single lever spindle speed

preselector for its Nos. 5 and 7 universal turret lathes.

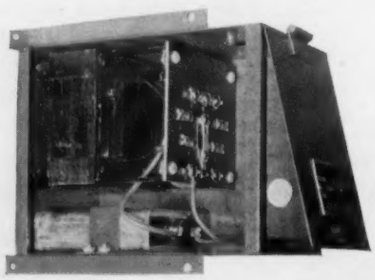
Spindle speeds may be preselected at any time and shifted almost instantaneously by the single control lever. Operator need not divert his eyes from his work. Spindle speeds are indicated on a dial in conjunction with which is a chart indicating the cutting speeds for corresponding diameters of work.

Gears are shifted hydraulically, the only manual effort necessary being that of slightly depressing the control lever at one point in its motion.

Controllers Are Custom Built to Suit Motors

■ Raytheon Mfg. Co., Newton, Mass., has developed a multistep speed controller for alternating current motors, which makes it possible to vary motor speed by changing input voltage.

This method of speed control permits operating motor by thermostat

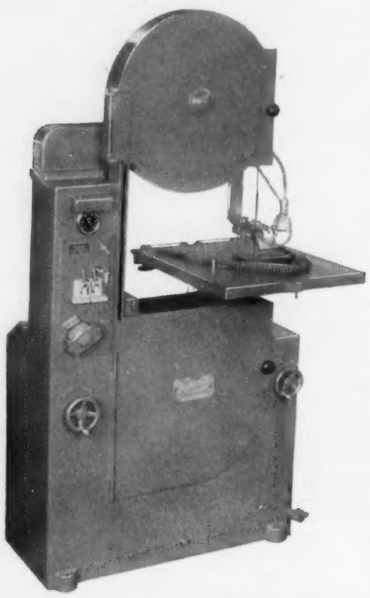


or automatic switch, because it insures restarting of motor regardless of controller setting. It has no moving parts. Controllers are custom built to suit motors and are sold only in quantity lots. Method of mounting is selected to meet customer's needs, and any desired method of voltage control is furnished.

Die Saw Construction Is Arc Welded Steel

■ Tannewitz Works, Grand Rapids, Mich., has added to its line the Model 24M Di-Saw, a machine for continuous sawing and filing of shapes, contours, etc., in ferrous and nonferrous metals, including tool steels and chromium alloys.

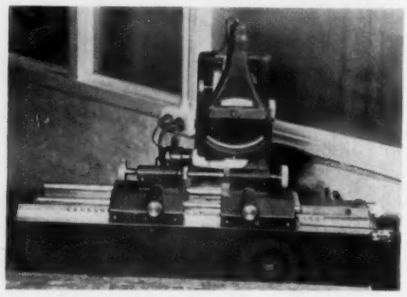
Chain files of exceptionally long lengths and various sizes and shapes may be used for both inside and outside work. Standard equipment includes a conventional type butt welder for joining blades up to ½-inch wide. When operator wishes



to saw inside contours, blade must be cut, slipped through the hole, welded, ground off, and then slipped back over the drive wheels.

Screw Lead Indicator With 2000:1 Visual Head

■ Sheffield Gage Corp., Dayton, O., is offering a Lead Testing machine incorporating a frictionless reed mechanism. This gage accurately compares the lead interval of screw and worm threads against a master block setting. Visual gage head,



through a reed mechanism, amplifies displacement of contact point 2000 to 1. Lowering of contact point into screw thread and complete vertical positioning are accomplished by convenient hand knobs. The work-carrying centers ride on precision balls in V-grooves and lock with respect to each other so that centers and work become, in effect, a single slide.

Plumber's Combination Gets In Close Quarters

■ Clayton & Lambert Mfg. Co., Detroit, has announced a combination burner particularly adapted for sweating fittings in residential plumbing and heating. Burner is of two-piece construction with a vein liner, renewable jet block and replaceable cleaner pin. Flame is

sharp pointed and at reduced flame measures ⅝-inch in diameter by 1¾ inches long. When opened wide, flame is ⅝-inch in diameter and 5 inches long. Ten feet of flexible gasoline hose connect burner to tank through a shut-off valve. Tank is heavily tinned inside and out to prevent corrosion. It also has a pump, a funnel-shaped filler opening with dust cap on filler plug, and a bracket for burner when not in use. Tank holds one gallon of gasoline, enough for 6 to 8 hours at full flame and proportionately longer at reduced flame.

High Capacity Circuit Breakers Are Announced

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has added to its line new air circuit breakers said to have twice the current-carrying capacity of previous breakers of the same dimensions.

These breakers are capable of interrupting peak currents of more than 200,000 amperes at voltages from 440 to 600. Their design includes interrupting devices that minimize formation of arc flames and gases during operation. Other changes include a new type of deionizing arc interrupter for either alternating or direct current.

Plug Gages In Ten-Thousandths of an Inch

■ Grobet File Corp. of America, New York, which last year introduced its line of high-speed steel flat drills for the piercing of small holes, announces its new line of cylindrical plug gages for checking these holes. Gages are high carbon tool steel, hardened, ground, and precision lapped and are immediately available from 0.010 to 0.084-inch, in thousandths of an inch. They also can be obtained in every 0.0005, 0.00025 or 0.0001 of an inch from 0.004 to 0.150-inch diameters. To check tolerances, double-end gages are offered.

Universal Thread Grinder

■ The announcement last week of the universal thread grinder by Jones & Lamson Machine Co., Springfield, Vt., gave the impression that grinding wheel spindle speed changes are made through sliding gears. The work spindle speed changes are made in this manner, but grinding wheel spindle speeds are regulated by a direct current motor and rheostat.

TO STAND UP UNDER PRESSURE
STEEL PICKS PENOLA
With a pressure of 5,000 pounds per square inch crushing down on a $10,000 roll neck bearing, a steel man can't afford to take any chances. He must have an extreme-pressure lubricant that he can depend on to do a consistent job of gear-protection, no matter how tough the going is. So he specifies Penola!
These two facts tell a powerful, convincing lubrication story:
• Over 80% of all roll neck bearings in 4-high mills are Penola-lubricated.
• Penola makes and sells more steel mill lubricants than any other maker in the world.
PENOLA LUBRICANTS
Penola Inc., Pittsburgh, Pa.
(Formerly Pennsylvania Lubricating Co.)
New York • Chicago • Detroit • St. Louis
LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1883

Plant Weldery

(*Concluded from Page 69*)

This is principally one for detail and appearance, insuring against the need for additional work after cleaning and painting.

An incentive system of wage payment has been used in this shop for the past 20 years. That it has given satisfaction is indicated by the entire absence of friction between the workers and management and by the complete failuer of a number of professional agitators.

The arc welding section is organized on the group system. Men doing similar or consecutive operations are banded into a group under a group leader.

First operation in preparing parts is cutting to size and shape. Efforts to obtain maximum use of the material, with minimum scrappage, must center at this stage. Fig. 2 shows layouts to reduce material requirements.

Templates Save Labor

Templates are probably the greatest labor savers that can be used in the preparation of component parts. Marking for cutting or punching is often reduced by 50 to 80 per cent.

Weld testing is necessary to insure a high standard of welding and to further the development and improvement of contributory factors.

Testing of materials includes both metal to be welded and metal deposited. Hence material tests are made of all plate stocks as they arrive in the plant. Testing of electrodes is done by the welding engineer, using the nick-break test for downhand types and the broken fillet weld test for the fillet and all position types. A continuous program of developmental testing is essential if the maximum advantages are to be realized from welding.

Accurate cost data in the simplest possible form is essential. Data should be available on which time values can be traced clear to every operator, and the men should be encouraged to question any point not clear.

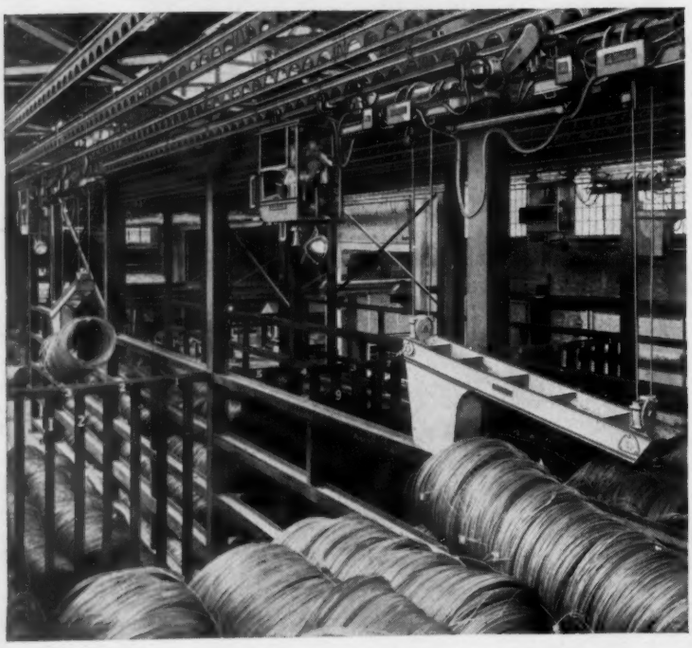
Estimating Similar

Estimating methods, like engineering and other forms of cost work, have not been changed radically by the introduction of arc welding. If more than one department can reasonably do a given operation, both get a chance at it, particularly borderline jobs. The estimate moves in the same manner as the job does, first to material preparation sections, then through machining and final assembly of parts with each cost control man covering the same part of the estimate that his division will do on the job. Material requirements are written into the estimate and weights calculated but not priced until it is embodied into the final writeup which is made by the cost control office staff from the data supplied by their shop representatives.

CLEVELAND TRAMRAIL

OVER HEAD HANDLING EQUIPMENT

IN THE ROD AND WIRE MILL



● Picking up 3400 pounds of rod per trip, transporting it to and accurately spotting the load in storage or gondola cars via Cleveland Tramrail.

● Other types of Cleveland Tramrail equipment for all departments of the rod and wire mill.

ALSO BUILDERS OF CLEVELAND CRANES ALL WELDED

CLEVELAND TRAMRAIL

DIVISION OF

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO.

Or Consult Your Phone Directory under Cleveland Tramrail

Statistics of Metals With Added Features

■ *Metal Statistics;* cloth, 632 pages, 4 x 6 inches; published by American Metal Market, New York; supplied by STEEL, Cleveland, for $2; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

It its thirty-second edition this volume follows the style of earlier issues in covering ferrous and nonferrous statistics and miscellaneous economic subjects, with numerous additions and alterations.

New material includes a series of tables on foreign and domestic copper production, deliveries and stocks; copper refiners' bids for No. 1 wire scrap; rolled steel production for sale; monthly average prices on two grades of remelted aluminum.

(*Concluded from Page* 64)

into the blanking press at the rate of 72 per minute, thus maximum or theoretical production is 4320 punchings per hour from each line; that is, 4320 rotor blanks and 4320 stator blanks. This gives a total of 25,920 per hour from this automatic press setup. Of course, in few plants would such a volume of laminations be required. However, by employing various numbers of laminations, this same size of lamination can be used in a fairly wide range of motor sizes and ratings and therefore is suitable for a large number of motors.

Just the one size cookie disk is handled in these presses but the same setup could be applied to various sizes provided, of course, that it was warranted by sufficient volume. All other sizes and jobs where a relatively small quantity of laminations is required are made in the miscellaneous stamping section where rotor and stator slots are usually punched out slot by slot on automatic indexing machines.

Pressure Feeding

Of particular interest in the automatic installation is the pressure feeding of rotor punchings through skeleton chutes as soon in Figs. 7 and 10. These guide chutes deliver the punchings to a point near the rotor notching presses and permit economic hand transfer to the magazine of the notching press. Also an unusual feature of this layout is the especially constructed conveyor which carries the pierced rotor punchings to the automatic stacker. The conveyor carries the punchings, maintaining them on edge as can be seen in Fig. 11 which shows delivery end of the conveyor.

Stator laminations after being stacked go to a machine where they are riveted together to form a complete motor stator core. After riveting they are placed in a housing formed by rolling a sheet of heavy steel into a tube into which the core is placed. The assembly then is welded forming a one-piece unit with no chance of vibration or dislocation. Welding of these stator housings is done in automatic equipment at a high rate of speed. Stator then is ready to receive the windings.

Hopeful Discussion of What Future Offers

■ *You and Your Money*, by C. Donald Dallas; cloth, 85 pages, 5½ x 8¼ inches; published by Prentice-Hall, New York; supplied by STEEL, Cleveland, for $1.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S. W. 1.

In this brief volume the author constructively discusses in clear, terse and simple language the economic and social questions that are rocking society today.

Its text is that our economic machine has been erected on the six basic ideas which the Declaration of Independence sought to provide and preserve; Self interest, individual initiative; private property, freedom of contract, equal opportunity and competition. Passage of time and new conditions have developed some changes in the foundation on which the machine was originally.

In this age of change when the State is set above the individual in so many lands, with America almost the only nation where individualism remains in force, this book sounds a note of cheer and encouragement, especially for the young, who are seeking to carve out their destiny.

The author outlines the present situation and discusses capitalism and communism, capital and labor, labor relations in England and Sweden, investments and investing, real estate, taxes and the struggle for security.

This is the third edition of this study, revised and much enlarged to bring it up to the present moment.

"Accurate Spotting" requires a
HAND-GEARED TROLLEY TYPE
A-E-CO LO-HED HOIST

When—1. The haul is short and load heavy or awkward. 2. The load must be accurately spotted, regardless of weight. 3. The load, because of its nature, must be carefully moved (chemicals, hot foundry ladles, etc.)—

The hand-geared trolley type A-E-CO Lo-Hed hoist—the one operated by a chain is the logical choice.

For high-lights of this hoist see A-E-CO POINTS (below). For full details of Lo-Hed hoists, send for our new catalog today.

AE CO POINTS

- Available in capacities from ½ to 6 tons.
- Operates on Standard I-beam or track of any make.
- Low headroom—stacks materials higher than any other hoist.
- Safe, fool-proof.
- Compact, strong, simply constructed.
- Protected against dust, moisture, fumes.
- Heavy duty, ball-bearing HOIST MOTOR.
- Automatic lowering brake.
- Ball or roller bearings at vital points.
- Improved plow-steel cable.
- 100% positive automatic stop.
- Efficient spur-gear drive . . . and

LO-HED COSTS LESS PER LIFT

OTHER A-E-CO PRODUCTS: Taylor Stokers, Marine Deck Auxiliaries, Hele-Shaw Fluid Power.

A-E-CO Lo-Hed HOISTS

AMERICAN ENGINEERING COMPANY
2484 ARAMINGO AVENUE, PHILADELPHIA, PA.

Suggests Tool Steels Be Narrowed to Fewer Types

■ TEN years of progress in tool steels and cutting materials were reviewed and highlighted by A. H. d'Arcambal, consulting metallurgist and sales manager of the small tools division, Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., speaking before the monthly meeting of the Detroit chapter of American Society for Metals, April 10.

Enumerating the various types of tool steels now in use, the speaker deplored the flood of new varieties which has been introduced in recent years, and said it was difficult for the metallurgist to keep up with the many new analyses perfected. He urged co-operative action by producers to narrow the field to a few types of steels.

Citing results achieved in the Pratt & Whitney plant, Mr. d'Arcambal stressed the advantages of the 18-4-2-high-speed steel for milling cutters, broaches, lathe tools, etc., used in machining alloy steels for aircraft parts ranging between 300 and 430 brinell in hardness. He also displayed cutters of high-carbon high-chrome steel used in metal lathe manufacture where tolerances on cutter thickness are of the order of 0.0002-inch.

Considering the hardening of tool steels, Mr. d'Arcambal complimented furnace builders on progress made in the last decade in furnace designs and atmosphere control. He further detailed a drawing technique adopted in his plant which is interesting. To prevent sticking of lead to threads of taps, the parts are first dipped in lead at 1100 degrees Fahr., then quenched in brine and then into lead again at 1400 degrees and a final quench in brine. The predipping and quenching forms a brine coating on the threads which prevents lead from adhering in the second dip.

New Nitriding Treatment

Perfection of a new surface hardening treatment of the nitriding type for tools, now in general use among tool suppliers, has resulted in substantially longer life on certain classes of tools such as reamers and taps. So successful has this treatment been, the speaker asserted, that it has superseded chromium plating of these tools.

A new cutting steel containing 1 per cent carbon, 5 chromium, 1 molybdenum and 1 vanadium, was mentioned as being an economical variety for efficient service on slitters and shears. Price is about one half that of high-speed steel.

Mr. d'Arcambal stated that research workers in his field have been looking for a satisfactory type of wear testing machine for about 20 years, and have yet to discover one. He indicated that such a machine would be a valuable addition to testing facilities, and his company is now in process of developing a new wear tester which it is hoped may answer the need.

Commenting on gages, the speaker showed a boron carbide plug gage which gave far better wear than even carbide tipped gages, the only adverse factor being its exceptional brittleness. Despite the latter quality, however, the boron carbide gage is proving to be most acceptable on certain gaging operations where proper care is taken to avoid fracturing it.

Germany, Italy Face Raw Materials Problem

(*Concluded from Page 27*)

to have produced 3,000,000 tons, compared with 1,900,000 tons in 1937, 1,000,000 tons in 1936, and 500,000 tons in 1934.

Ore in Scattered Deposits

Germany itself has no really large and rich ore deposits within its boundaries, but has intensively developed many scattered bodies of low and medium grade ores. Most extensive deposits are in the East Rhine, Weser and Thuringia districts. The outstanding source is the Seigerland district in the East Rhine region, where the ore, occurring in veins, is a carbonate with 38 to 40 per cent iron content and 6 to 8 per cent manganese. Weser and Thuringia ores are low grade and require roasting.

The Hermann Goering steelworks, started in 1937, are designed to work the low grade Salzgitter ore and also those of southern Germany. Grandiose plans have been advanced to raise the domestic output to 20,000,000 or 30,000,000 tons within the next few years.

While admiring Germany's progress toward technological self-sufficiency, geologists and economic experts still believe Germany must continue to look to outside sources for a large portion of ore requirements.

Prof. Edward Sampson, Princeton university geologist, says: "Germany's own iron ore resources are hopelessly inadequate . . . Rigorous economy and re-use of scrap iron, combined with stockpiling of scrap iron, might suffice for military needs. If Germany were cut off from French and Swedish supplies, her situation would be difficult in a long war.

"It would seem," Professor Sampson continues, "Germany is by no means ready to undertake a protracted war, and indeed has probably not gathered sufficient supplies to support her full man power in a short war against a major power."

Germany's improvement in all mineral resources since 1929, however, has been more pronounced than any other major power, excepting Russia. Professor Sampson illustrates this progress by the following table:

	Relative ratings on basis Germany = 100		Ratio which Germany's rating bears to the rating of each other country	
	1929	1936	1929	1936
Germany	100	100	.....	.....
United States	480	355	.21	.28
British Empire	295	265	.34	.38
U.S.S.R.	55	112	1.9	.89
France and possessions	110	75	.92	1.4
France	80	55	1.2	1.7
United Kingdom	65	55	1.6	1.8
Japan and possessions	20	35	5.3	2.8
Italy	20	20	5.7	5.6
Spain	25	10	3.8	10.
Poland	15	10	7.2	12.

Italy, the other power likely to share Spain's mineral resources, has only small reserves of iron ore, mainly on the island of Elba. Another source of iron is *scoria*, slag which was inefficiently smelted in ancient forges and discarded. This is found in large quantities, especially near Piombino, opposite Elba, and contains up to 50 per cent iron.

In 1938, Italy increased iron ore imports 92.04 per cent to 400,617 metric tons. Italy also imported about 600,000 tons of scrap, an increase of nearly 13 per cent over 1937. Scrap is the principal ferrous raw material import of Italy.

Italy Low On Fuel

Italy lacks not only important iron ore reserves, but also fuel, and is a small pig iron producer. Last year's pig iron production was 940,000 tons, higher than the 718,000 tons produced in 1929. Steel production in 1938 totaled 2,330,000 tons.

Italy's and Germany's sharing of Spain's surplus mineral resources depends on General Franco's adherence to the Rome-Berlin axis. Some observers doubt the tie's permanence, although it is believed Italy and Germany will maintain tremendous pressure on Franco. It is understood Germany made access to the Spanish ore deposits one of the conditions for support of Franco.

Aluminum in Fight Against Silicosis

■ How fine aluminum dust is mixed with dust containing traces of silica to combat silicosis is described in a pamphlet. "Aluminum and Silicosis," by R. C. Emmons and Carl Fries of the University of Wisconsin Department of Geology. Copies may be had from "American Mineralogist," published by U. S. Geological Survey, Washington, D. C.

Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Machinery and Tools

Brown & Sharpe Mfg. Co.—640-page illustrated catalog No. 141. Milling, grinding and screw machines, machinists' tools, cutters, hobs, arbors, collets and adapters, screw machine tools pumps and miscellaneous equipment are described. Cross-indexing makes reference easy. Engineering tables are included.

(2)—Die Heads

Landis Machine Co.—12-page illustrated bulletin No. F-80-3. Hardened and ground die heads of three types, especially recommended for threading work where fine accuracy and maximum production are important, are fully described. Full specifications, diagrams of clearances and descriptive information are given.

(3)—Motors

Allis-Chalmers Manufacturing Co.—16-page illustrated bulletin No. 1196. "Making Machine Tools Earn Their Way", shows applications of motors on machine tools. Illustrations show numerous installations. Advantages of using "Lo-Maintenance" motors are set forth.

(4)—Metal Spinning

Milwaukee Metal Spinning Co.—4-page illustrated filable bulletin No. S.P.1. Describes the art of metal spinning and shows seven successive stages in spinning an aluminum cover. Shop views and step by step explanation are given.

(5)—Air Equipment

Galland-Henning Mfg. Co.—4-page illustrated folder on "Nopak" valves and air cylinders. "Nopak" air valves of various types and cushioned air cylinders for industrial applications are described. A table of air losses compared to leaks at various pressures is included. Structural features of the equipment are shown.

(6)—Stack-Cutting

The Linde Air Products Co.—8 page illustrated booklet. How large quantities of simple or intricate shapes are produced from piled sheets or plates of steel by oxy-acetylene cutting process is described. Increased production, greater uniformity of shape-cut parts and lower unit costs are advantages.

(7)—High Speed Press

The V. & O. Press Co., Inc.—6 page illustrated bulletin No. 2HS-39. Announcement of new high speed blanking press which is said to be extremely accurate, rigid and fast, and to have complete accessibility. Uses standard dies. Complete specifications are included.

(8)—Broaches

American Broach & Machine Co.—32-page illustrated catalog No. 139. American broaches and broaching machine tool set-ups are illustrated and described. Engineering tables, specifications and a section on care and maintenance of broaches are included.

(9)—Milling Machine

Fray-Mershon, Inc.—8-page illustrated bulletin. A new full universal, high speed, milling attachment for all horizontal mills is announced and described. Attachment does not need to be taken off when mill is to be used for any other operation. Unit is self contained. Full information and specifications are included.

(10)—Tap Drill Gauge

Dayton Rogers Manufacturing Co.—Pocket size time saver disc giving correct size of tap drills for U. S. gauge screw threads and decimal equivalent chart. Made of grease and oil resisting material for long life. Complete list of tap drill sizes for National Pipe thread standards is also included.

(11)—Air Equipment

American Blower Corp.—8-page illustrated folder No. A-24029. Progress in the manufacture of air handling equipment is shown. Numerous types of industrial fans, blowers, air conditioning and other units are shown. Research facilities for solving industrial problems are shown.

(12)—Instruments

Wheelco Instruments Co.—62-page illustrated loose leaf type catalog on temperature control, indicating and safety instruments. Numerous units for industrial applications together with accessories and installation information are described.

STEEL
Readers' Service Dept.
1213 West Third St.,
Cleveland, Ohio

IIL
4-17-39

Send me the literature I have circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29			

Name _____

Company _____ **Title** _____

Address _____

City _____ **State** _____

This card must be completely filled out.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L.& R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND, OHIO

Readers' Service Dept.

HELPFUL LITERATURE

(13)—Turret Lathes

Bardons and Oliver, Inc.—12-page illustrated bulletin No. 5 and 7. Nos. 5 and 7 universal turret lathes with single lever spindle speed pre-selector or conventional three lever speed change, and with several new features are described. Cross-sectional illustrations, full specifications and information on tools and attachments are included.

(14)—Indicating Gauges

The Foxboro Co.—8-page illustrated bulletin No. 229. Explains functions and advantages of Foxboro gauges where pressure is an important factor. Cross-sectional illustration outlines movement of the Model "P" gauges. Specifications for various gauges are given. Accessories available to adapt gauges to any application are covered.

(15)—V-Belt Drives

T. B. Wood's Sons Co.—56-page illustrated catalog No. 182. Advantages, uses, general information, specifications and price lists of V-belt drives and sheaves are covered in this catalog. Information on selection of V-belt drives using stock sheaves is given. Engineering data and tables complete the book.

(16)—Forgings

The Steel Improvement & Forge Co. —34 page illustrated booklet "Forging Ahead With Forgings." The design, use and applications of forgings are covered, and various types of forgings are explained. Production views show various steps in the making of forgings in this company's plant.

(17)—Filters

The Cuno Engineering Corp. — 24 page illustrated booklet "80 Ways to Make More Money." Describes use of filters in numerous industries and processes, and for handling many kinds of liquids. Conveniently thumb-indexed.

(18)—Automatic Filter

S. F. Bowser & Co., Inc.—4 page illustrated bulletin No. 5922. The figure 822 self-cleaning automatic filter for lubricating oils and other liquids is described and complete specifications given. Greatly increased filtration area per square foot is provided. Five sizes are available.

(19)—Welding

Progressive Welder Co.—8-page illustrated bulletin No. 3902. Portable hydraulic welding equipment for production welding, and a brief summary of a few of more than 250 portable welding gun types are described. Hydraulic punching and stripping units are also described.

(20)—Wire Rope

A. Leschen & Sons Rope Co.—44-page illustrated pocket size booklet "Practical Information on the Use and Care of Wire Rope", Fourth Edition. A cross-indexed handbook describing recommended methods and practices in the use and care of wire rope.

(21)—D. C. Mill Motors

Harnischfeger Corp.—4 page illustrated filable folder, Bulletin No. C-4. P. & H. heavy duty D. C. mill motors with full number of interpoles for all ratings are described and illustrated with a large sectional photograph. Important features are detailed.

(22)—Rotary Shears

The Quickwork Co.—4 page illustrated bulletin. Rotary shears with capacities up to 1 inch thick mild steel and with throat depths up to 60 inches are described. Stamping trimmers and power hammers are also covered.

(23)—Welding

A. M. Byers Co.—16 page illustrated bulletin No. 2-39. The welding of wrought iron is fully discussed and described. Various types of welding is included. Physical properties of welds in wrought iron are discussed.

(24)—Industrial Lighting

General Electric Co.—40-page illustrated book "Lighting for Production in the Factory", No. LD-15. This bulletin discusses the factory lighting problem in terms of new knowledge of seeing. It incorporates lighting suggestions that should prove helpful to every factory manager. Interior and exterior lighting are considered.

(25)—Refractories

Harbison-Walker Refractories Co.—6-page illustrated folder. Describes refractories manufactured by this company in the South. HWRCO Crown, high heat duty fireclay brick, WYLAM, moderate heat duty fireclay brick and STAR silica brick, as well as bonding morters are covered. Recommended uses and location of warehouse stocks are covered.

(26)—High Speed Steel

Crucible Steel Company of America.—8 page folder describing the 7 grades of Rex high speed steel. Full information on characteristics, working and hardening instructions and advantages of the 7 grades are given. A complete list of branch offices and warehouses is included.

(27)—Electric Switches

Micro Switch Corp.—4-page illustrated bulletin No. 18A. Design, operation and application of Micro Switches for industrial applications are shown. Numerous typical applications are pictured. These units will operate in any position and are approved by Underwriter's Laboratories.

(28)—Drilling and Boring

W. F. & John Barnes—8-page illustrated bulletin No. 912. The 912 standard vertical drilling and boring machine with wide adaptability, is fully described. Typical set-ups and specifications are covered.

(29)—Presses and Shears

Niagara Machine & Tool Works—12-page illustrated folder. A pictorial resume of the complete line of latest Niagara presses, shears and machines for sheet metal and plate work. Thirteen sizes and types are shown.

STEEL
Readers' Service Dept.
1213 West Third St.,
Cleveland, Ohio

IIR
4-17-39

Send me the literature I have circled below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29			

Name_____

Company_____ Title_____

Address_____

City_____ State_____

This card must be completely filled out.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P. L. & R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2c POSTAGE WILL BE PAID BY—

STEEL
Penton Building
CLEVELAND, OHIO

Readers' Service Dept.

Markets Tending Downward Slowly

Sentiment Affected More Than Demand; Shape Orders Heavier

MARKET IN TABLOID ★

Demand
Generally downward; tin plate, structurals more active

Prices
Fairly steady; scrap composite at new low for year.

Production
Down 2 points to 51½ per cent.

■ RETARDING factors weigh most heavily among the mixed trends in steel markets, resulting in moderate losses in demand and production.

Business actually makes a better showing than is indicated by the abrupt weakening of sentiment the past two weeks. This leads producers to believe that the downward trend apparently in store for activity the next 30 to 60 days will be gradual, rather than sharp. Steelmaking the past week was down 2 points to 51½ per cent, matching the previous low for 1939 to date but comparing with 32 per cent a year ago.

Except for automotive demand, the decline in finished steel orders lately has been small. In some districts little change is shown compared with the volume of the last six months. Automobile assemblies have yet to fulfill recent predictions of a major recession, but parts manufacturing has tapered and little additional steel buying for remaining production of 1939 models is in sight.

One interest, planning introduction of 1940 models in mid-summer, has placed some small steel orders for preliminary work on the new cars. However, most other makers are not expected to offer new models until late summer or early fall.

Motorcar assemblies last week again increased about 1000 units to 88,050, fourth best week for the year to date and nearly 45 per cent larger than a year ago. General Motors accounted for most of the gain, boosting output from 32,735 units to 34,680. Chrysler expanded from 20,525 to 20,725, but Ford held at 22,230 and all others dropped from 11,529 to 10,415.

Building Steel Awards And Inquiries In Spurt

In some products the letdown in demand lately is more evident in size of orders than in number, reflecting the tendency of consumers to restrict stocks. Partially offsetting the quieter market for commoner steel grades are gradual improvement in tin plate specifications and a bulge in activity in structural shape and concrete reinforcing bar markets.

Structural awards last week were heavy, nearly 20,000 tons being involved in eight major projects alone. Principal items included 4370 tons for TVA transmission towers, 4200 tons for a Chicago school, 3700 tons for a hospital, Brentwood, N. Y., and 3000 tons for a Boston sewer. Among inquiries are 6000 tons for dam towers in California, 4000 tons for a viaduct, Kansas City, Mo., 3700 tons for convention and music halls, Buffalo, and 3000 tons for Southern Pacific railroad bridges in California.

Outstanding in concrete bar inquiries are 9000 tons for government buildings, Washington, and 4200 tons for a bridge and courthouse, Seattle. Bar awards are headed by 3000 tons for the East river drive, New York.

Rail Bookings Past Six Months Increase Sharply

Except for the recent order of the Missouri Pacific for 1150 freight cars, railroad equipment buying still is light. Only a few of the larger roads have yet to place 1939 rail needs, and prospects for secondary buying later in the year are indefinite. However, rail purchases the past six months were nearly 85 per cent larger than one year previous, and orders for both track material and freight cars during this period showed a larger gain compared with a year ago than did steel ingot production.

Last week's decline in steelmaking was sharpest in districts affected mostly by automotive tonnage. Detroit operations were down 10 points to 59 per cent and Cleveland slumped 13 points to 39½. Other recessions included 4 points to 45 at Pittsburgh, 5 points to 43 at Youngstown, 2 points to 60 at Birmingham and 1 point to 65 at Wheeling.

Cincinnati increased 7 points to 51 and St. Louis was up 2½ to 44½. Unchanged districts were eastern Pennsylvania at 40, Chicago at 53½, Buffalo at 44½ and New England at 35.

Scrap prices have weakened further in most areas, influenced by the less favorable outlook for steelmaking. Reductions at Chicago and Pittsburgh lower the scrap composite 58 cents to $14.46, lowest since last November. The finished steel composite is unchanged at $56.50. While there are scattered reports of shading, steel prices generally are steady.

COMPOSITE MARKET AVERAGES

	Apr. 15	Apr. 8	Apr. 1	One Month Ago Mar., 1939	Three Months Ago Jan., 1939	One Year Ago Apr., 1938	Five Years Ago Apr., 1934
Iron and Steel	$36.32	$36.40	$36.42	$36.40	$36.36	$38.61	$32.67
Finished Steel	56.50	56.50	56.50	56.50	56.50	61.70	53.90
Steelworks Scrap..	14.46	15.04	15.04	14.98	14.77	12.30	12.15

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 15, 1939	March 1939	Jan. 1939	April 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.765
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.45
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	April 15, 1939	March 1939	Jan. 1939	April 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$25.30
Basic, Valley	20.50	20.50	20.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	25.21
No. 2 foundry, Chicago	21.00	21.00	21.00	24.00
Southern No. 2, Birmingham	17.38	17.38	17.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	26.215
Malleable, Valley	21.00	21.00	21.00	24.00
Malleable, Chicago	21.00	21.00	21.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	24.17
Ferromanganese, del. Pittsburgh	85.33	85.27	90.25	107.77

Scrap

Heavy melting steel, Pittsburgh	$15.25	$15.75	$15.60	$12.70
Heavy melt. steel, No. 2, E. Pa.	13.75	13.375	13.25	11.55
Heavy melting steel, Chicago	12.75	14.25	13.75	11.45
Rails for rolling, Chicago	17.25	17.25	17.75	15.25
Railroad steel specialties, Chicago	14.75	16.25	16.00	13.75

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.25
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c

Iron

Chicago, Terre Haute	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Chicago, Gary, Buffalo Cleve., Birm., Young., Sparrows Pt., Pitts.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45

(Per pound)

Polished staples	3.15c
Galv. fence staples	3.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.80; two-point cattle, 80-rod spool	$2.62
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

*Delivered.

Alloy Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.80c
Detroit, delivered	2.90c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(*Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons*)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(*Gross Tons*)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞—1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller	67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off

Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(*Gross Tons*)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., *base*

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 11/32-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$60.80
First Quality	
Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50
Second Quality	
Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00
Ohio	
First quality	39.90
Intermediate	36.10
Second quality	31.35
Malleable Bung Brick	
All bases	$56.05
Silica Brick	
Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	$28.00
Wire cut	$26.00

Magnesite	
Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$22.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $17, barge	$18.00
No. 2 lump	18.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.65-1.70

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c
67-72% carloads, 2% carbon, per lb. contained
chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do, 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.61
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.40	4.60	4.50
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.33
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	....	3.85	3.85	5.20	3.90	....	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.43	3.58	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.72	3.87	3.87	3.47	3.47	5.07	3.53	4.47	4.53
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.00	4.15	4.15	3.95	3.95	5.71	3.90	....	5.25
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.41	4.41	6.01	4.47	....	5.47
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	3.95	....	5.25
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
San Francisco	3.65	4.05	6.00	3.60	3.60	5.20	3.60	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.61	4.18	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.14	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.11	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.10	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.20	....	....	....	....	....	....	....
Buffalo	3.57	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.70	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	3.80	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	3.85	3.58	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.05	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.39	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	3.93	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.07	3.92	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.44	....	....	....	....	....	....	....
Tulsa, Okla	....	4.84	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.50	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, April 13

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports	£ s d	Continental Channel or North Sea ports, gross tons Quoted in dollars at current value	**Quoted in gold pounds sterling	£ s d
Foundry, 2.50-3.00 Si.	$23.45	5 0 0	$17.25		2 0 6
Basic bessemer	....	.....	16.40		1 18 6
Hematite, Phos. .03-.05	26.97	5 15 0*	.....		.....
Billets	$34.59	7 7 6	$38.34		4 10 0
Wire rods, No. 5 gage	53.35	11 7 6	42.60		5 0 0
Standard rails	$44.56	9 10 0	$48.99		5 15 0
Merchant bars	2.30c	11 0 0	1.85c to 1.95c	4 15 0 to 5 0 0	
Structural shapes	2.09c	10 0 0	1.85c to 1.90c	4 15 0 to 4 17 6	
Plates, †¼ in. or 5 mm.	2.29c	10 18 9	2.10c to 2.34c	5 7 6 to 6 0 0	
Sheets, black, 24 gage or 0.5 mm	2.72c	13 0 0	2.93c	7 10 0*	
Sheets, gal., 24 ga., corr.	3.29c	15 15 0	3.61c	9 5 0	
Bands and strips	2.77c	13 5 0	1.95c	5 0 0	
Plain wire, base	4.08c	19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0	
Galvanized wire, base	4.86c	23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6	
Wire nails, base	.....	.....	2.73c to 2.93c	7 0 0 to 7 10 0	
Tin plate, box 108 lbs.	$ 4.73	1 0 3	.....	.....	

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$23.22	4 19 0(a)	$16.44	620.50	$15.17	450	$25.26	63
Basic bess. pig iron	21.69	4 12 6(a)	.....	...	.....	...	27.86(b)	69.50
Furnace coke	5.39	1 4 2	5.96	225	7.25	215	7.62	19
Billets	34.59	7 7 6	25.04	945	28.98	860	38.69	96.50
Standard rails	1.99c	9 10 0	1.56c	1,300	2.06c	1,375	2.38c	132
Merchant bars	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100	1.98c	110
Structural shapes	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375	2.29c	127
Sheets, black	3.08c	14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.61c	17 5 0	3.30c	2,750	4.13c	2,750	6.66c	370
Plain wire	4.08c	19 10 0	1.92c	1,600	2.48c	1,650	3.11c	173
Bands and strips	2.58c	12 7 0††	1.71c	1,340	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, N. 1	13.50-14.00
Buffalo, No. 2	11.50-12.00
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	11.00-11.50
Chicago, No. 2 auto	10.00-10.50
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	14.00-14.50
Cleveland, No. 2	13.00-13.50
Detroit, No. 1	10.50-11.00
Detroit, No. 2	9.00- 9.50
Detroit (industrial)	10.50-11.00
Eastern Pa., No. 1	15.50-16.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	11.75-12.25
Granite City, R. R.	11.50-12.00
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.25-16.75
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	14.00-14.50
St. Louis, R. R.	11.75-12.25
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	12.00
Seattle, No. 1	12.00
Toronto, dirs. No. 1	9.75-10.25
Valleys, No. 1	14.25-14.75

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	11.50-12.00
Chicago, dealer	10.75-11.25
Cincinnati, dealers	10.75-11.25
Cleveland	13.50-14.50
Detroit	11.50-12.00
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	9.50-10.00
Valleys	13.75-14.25

BUNDLED SHEETS

Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.50-11.00
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.00-14.50
St. Louis	7.00- 7.50
Toronto, dealers	8.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50- 8.00
Cincinnati, dealers	6.75- 7.25
Detroit	8.75- 9.25
†Los Angeles	3.75- 4.00
St. Louis	6.00- 6.50

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	11.25-11.75
Cincin., No. 1, deal.	8.25- 8.75
Cincinnati, No. 2	3.75- 4.25
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	10.50-11.00
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	4.25- 4.75

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	7.50- 8.00
Detroit	5.50- 6.00
Eastern Pa.	9.50-10.00
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.75-10.25
St. Louis	3.00- 3.50
Toronto, dealers	4.25- 4.75
Valleys	8.75- 9.25

SHOVELING TURNINGS

Buffalo	7.25- 8.00
Cleveland	8.00- 8.50
Chicago	7.50- 8.00
Detroit	6.50- 7.00
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.25
Cincinnati, dealers	3.25- 3.75
Cleveland	8.00- 8.50
Eastern Pa.	6.50- 7.00
Detroit	6.00- 6.50
New York	†2.50- 3.00
Pittsburgh	8.75- 9.00
Toronto, dealers	5.25- 5.75

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	12.50-13.00
East. Pa., elec. fur.	13.50
St. Louis	9.50-10.00
Toronto	4.50- 4.75

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†5.00
Buffalo	7.50- 8.00
Chicago	5.50- 6.00
Cincinnati, dealers	3.25- 3.75
Cleveland	8.00- 8.50
Detroit	6.00- 6.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	4.25- 4.75

RAILROAD SPECIALTIES

Chicago	14.50-15.00

ANGLE BARS—STEEL

Chicago	15.00-15.50
St. Louis	13.50-14.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.50-16.00
Chicago, leaf	15.00-15.50
Eastern Pa.	17.50-18.00
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.25-15.75
Chicago (2 ft.)	15.50-16.00
Cincinnati, dealers	16.50-17.00
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	12.50-13.00
Cleveland	17.00-17.50
Pittsburgh	17.00-17.50
St. Louis	13.00-13.50
Seattle	16.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.00-13.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	7.25- 7.75
Cincinnati, dealers	7.00- 7.50

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	12.00-12.50

FORGE FLASHINGS

Boston district	†8.50
Buffalo	11.50-12.00
Cleveland	11.50-12.00
Detroit	9.75-10.25
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	14.50-15.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†15.00
Chicago, net	17.50-18.00
Eastern Pa.	21.00-21.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	15.00-15.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†15.25-15.75
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾"	17.50-18.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	12.25-12.75
Chicago, rolled steel	14.25-14.75
Cincin., iron, deal.	13.00-13.50
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	17.50-18.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	18.00-18.50
St. Louis, iron	14.50-15.00
St. Louis, iron	14.00-14.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	9.50-10.00
Chicago, auto net	11.00-11.50
Chicago, railr'd net	10.25-10.75
Chicago, mach. net	11.00-11.50
Cincin., mach. deal.	13.50-14.00
Cleveland, mach.	16.50-17.00
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.25-15.75
San Francisco, del.	13.50-14.00
Seattle	12.00-14.50
St. Louis, cupola	12.00-12.50
St. Louis, agri. mach.	13.50-14.00
St. L., No. 1 mach.	14.00-14.50
Toronto, No. 1, mach., net	12.25-13.25

HEAVY CAST

Boston dist. break.	†9.75
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break, net	12.50-13.00
Detroit, auto net	13.00-13.50
Detroit, break.	10.50-11.00
Eastern Pa.	15.00-15.50
Los Ang., auto, net	13.00-13.50
New York, break.	†10.50-11.00
Pittsburgh, break	13.25-13.75

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	8.00- 8.50
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.50- 8.00
Eastern Pa.	13.50
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	7.75- 8.25

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	14.25-14.75
Cincin., agri., deal.	12.00-12.50
Cleveland, rail	15.50-16.00
Eastern Pa., R. R.	15.00-16.50
Los Angeles	17.50-18.00
Pittsburgh, rail	15.00-15.50
St. Louis, R. R.	12.25-12.75

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	9.00- 9.50
Tungsten, sh. ton unit, duty pd. nom.	20.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

—The Market Week—

Sheets, Strip

Sheet and Strip Prices, Pages 88, 89

Pittsburgh—Sheet production and orders continue to decline. New business is well below output, and further reduction in operations is forecast. Automotive releases are lighter and additional buying to complete assembly of 1939 models is expected to be relatively small. Inventories of flat-rolled steel held by automotive interests are believed to have been underestimated considerably. Sheet mill schedules are slightly below 55 per cent, with hot strip output about 30 and cold strip at 35. Galvanizing operations are steady at 60 per cent.

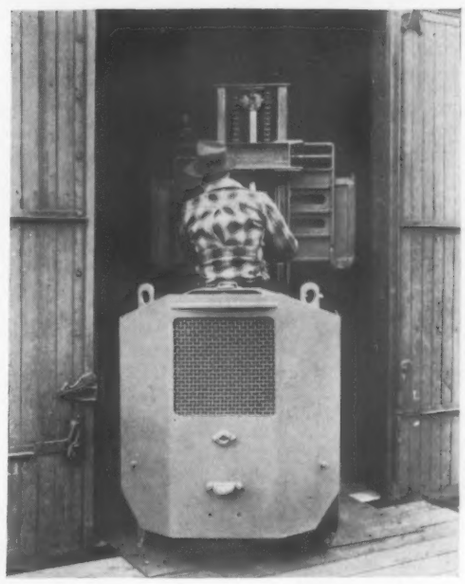
Cleveland—Sheet buying is slower, and with little more than fill-in tonnages in prospect from the automotive industry, no definite reversal in the recent downward trend in demand is seen for this month. At the same time, consumption among a number of miscellaneous users is well sustained, with makers of household equipment holding to fairly active schedules. Buying last month in anticipation of new quantity differentials now effective tends to postpone placing of some business, although this practice was not universal. Prices remain to be tested thoroughly.

Chicago—New business is unchanged and generally in small lots for immediate needs. The outlook is uncertain, partly because of the automotive situation. Heavier buying by Detroit interests is thought unlikely to appear until tonnage for 1940 models is ordered in July or August.

Boston—Sheet buying is confined mostly to fill-in needs, with current shipments largely against old orders. Demand by the building trade is less than expected, while stampers, fabricators of small tanks and industrial consumers generally are working off stocks. Cold strip continues slow, with prompt delivery asked on most tonnage. Strip mills have small backlogs and operations are irregular at about 55 per cent in most instances. Demand by automobile parts makers continues to slacken.

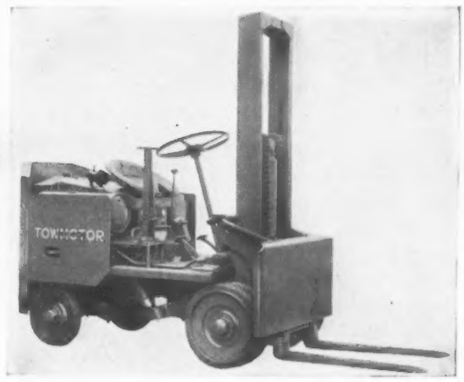
New York — As for some time past demand for narrow cold strip has improved slightly during the first two weeks of April. Consumers, on a close-to-needs policy, have been buying monthly requirements the first ten days, purchasing cautiously and little during the last half of each month. Shipments are now keyed closely to incoming business as are operations, most eastern producers lacking backlogs. De-

CAR LOADERS?



NEW MODEL C-L, 47" WHEEL BASE, LOAD CAP. 4000 LBS.

Yes! WE'VE BEEN BUILDING THEM FOR 6 YRS.



STANDARD MODEL L, 58 1/4" WHEEL BASE, LOAD CAP. 6000 LBS.

Carloading is not new to TOWMOTOR. For over 20 years TOWMOTOR Tractors have been used to push and pull freight in and out of box cars. For 6 years TOWMOTOR Lift Trucks have been doing it. Now TOWMOTOR offers a still shorter and more condensed lift truck for carloading, as well as other handling operations. The new Model C-L has a shorter—47"—wheel base with load cap. of 4000 lbs. Built with single or telescopic mast. Equipped with forks, flat plate or ram. *All vital operating parts standard and interchangeable with other models.* No cheapening of construction—no reduction in size of vital operating parts. Just a shorter machine to turn in a smaller radius, operate in still closer quarters and still offering the lowest cost per ton moved. Write for new bulletin of action pictures today, explaining your requirements so we can send specifications on model best suited to your needs.

PIONEERS OF STRAIGHT GAS POWER AND SEATED CENTER CONTROL FOR 20 YEARS.

Towmotor Co., 1247 East 152nd St., Cleveland, Ohio.

New York Office: 92 Liberty St., Phone: REctor 2-3977
SALES OFFICES IN 22 PRINCIPAL CITIES

TOWMOTORS CLEVELAND

LIFT TRUCKS AND TRACTORS

mand from the automotive trade is notably dull.

Sheet buying is largely for early needs, with some consumers working on tonnage placed previously and ordering only small fill-in lots. This applies to manufacturers of refrigerators, metal doors and door bucks and air conditioning equipment. Makers of kitchen ware are tapering their output seasonally, while stove interests have built sufficient stocks to meet spring requirements and are buying little sheet tonnage. Total sheet business is about on a par with the last two weeks in March but is down from February and early-March levels.

Philadelphia—Business is spotty, with tonnage so far this month lighter than in March. Stove requirements are holding up surprisingly well, according to some sellers. Narrow strip demand is limited to small lots, but total volume is steady.

Buffalo—Sheet and strip demand has been without major change the past four weeks, although a seasonal upturn had been expected by this time. Automotive orders have been below expectations, but miscellaneous specifications are holding up relatively well.

Cincinnati — Miscellaneous sheet demand, including needs for household equipment, is fairly steady, but automotive demand continues disappointing. Generally, all new buying is for immediate shipment. Uncertainty over the outlook is reflected in a few suspensions of shipments against old orders.

St. Louis—Demand continues below expectations. Needs of stove and refrigerator interests are well maintained, but miscellaneous buying has fallen off noticeably. Corrugated roofing sheets are moving slightly better, particularly to the South, but manufacturing demand for lighter galvanized sheets is lighter than a month or six weeks ago.

Birmingham, Ala.—Sheets remain the backbone of steel production at the moment as declines have been noted in several other specifications. Output is at or near capacity, although it is probable there has been some slackening in both manufacturers' and roofing sheets. Little strip is being produced in this territory.

Carboloy Drills Reduced

Carboloy Co. Inc., Detroit, has announced reductions ranging up to 31 per cent on 14 standard sizes of Carboloy masonry drills, effective April 15. Introduced in January, these drills have doubled sales each month since and resulting manufacturing economies are being passed on to consumers.

Plates

Plate Prices, Page 88

Boston — Except for shipbuilding specifications, plate demand is light. Few carlot releases are being placed by miscellaneous consumers and less specified work is pending, although close to 1000 tons is still active for a New Britain sewage disposal plant. A good part of the tonnage required for eight submarines, four to be built by private yards, bids May 24, and four by navy yards, is expected to be placed by New England yards. An equal number of destroyers are being estimated. Railroad, structural and boiler shop buying is slack.

Philadelphia—Plate demand from boiler interests is slightly better, but business in general is quiet. Some ship releases at Chester, Pa., are expected later this month, and a fair tonnage is required for a mine layer just awarded the local navy yard.

Birmingham, Ala.—Most plate inquiries are in small lots, with no large individual tonnage. Demand is hardly better than fair, although there is considerable pending work.

San Francisco — The only plate letting of size went to American Pipe & Steel Corp., Alhambra, Calif., 700 tons for an 8 and 12-inch welded steel pipe line for Fallbrook, Calif. Alternate bids were taken on 678 tons of lapwelded steel pipe. So far this year 15,492 tons have been placed, compared with 12,428 tons for the same period a year ago.

Plate Contracts Placed

700 tons, 8 and 12-inch welded steel pipe, Fallbrook, Calif., to American Pipe & Steel Corp., Alhambra, Calif.

Bars

Bar Prices, Page 88

Cleveland — Steel bar orders are sustained in number but a falling off in size of individual purchases has restricted total tonnage. The decline in consumption lately has been small, leading to expectations of only a moderate recession in bookings for the near future. Lessened requirements of automotive interests account for a large share of recent tapering in demand.

Chicago—Business in carbon and alloy bars continues to lag, these items having been particularly affected by recent declining demand for finished steel. Automotive interests are buying lightly. Most present demand is from a broad range of miscellaneous interests, which are holding their requirements at a fairly consistent rate, following recent slackening. Agricultural equipment manufacturing interests have sustained their demand, but some producing interests feel this source will begin to taper within the next 30 days.

Boston — In small lots, with alloys making relatively the best showing, commercial steel bar buying is unchanged. Comparatively more tonnage is going into airplane parts. Consumers of forging bars are buying sparingly, including producers of small tools and automobile parts. Railroad demand continues to lag, but shipyard specifications are steady and jobbers are buying only to keep stocks balanced. Machine tool shops are steady consumers in small lots, generally placed with secondary sellers.

New York—Outstanding in bar demand are better specifications from government shops and further improvement in releases from machinery builders. Buying by aircraft interests also is brisk and while not involving a large tonnage, represents a substantial dollar valuation. Hot-rolled carbon bars are relatively slow compared with activity in alloy and cold-drawn material.

Buffalo—Demand is well sustained, despite absence of an appreciable pickup lately. Producers are maintaining fairly active rolling schedules on mills devoted to concrete bar orders. Inquiries from automotive interests are only fair.

Birmingham, Ala.—Bars are holding fairly close to the somewhat better tone noted several weeks ago, although there has been some slackening in demand, especially from agricultural implement sources. Concrete reinforcing bars continue in fair demand.

Tin Plate

Tin Plate Prices, Page 88

Tin plate demand is responding slowly to seasonal influences. Specifications for sanitary can material are increasing, while needs for production of line cans and miscellaneous items are sustained. Volume is substantially better than a year ago, although in some instances orders are short of expectations held by the trade earlier in the year.

Further gains in demand are anticipated this quarter, with the peak of the season still a number of

weeks away. Tin plate operations hold at 62 per cent. Operations in the Chicago district are estimated at 65 per cent.

Pipe

Pipe Prices, Page 89

Pittsburgh—Pipe production is fairly steady, although improvement in some products has been less than seasonal and output of others has declined slightly. Standard pipe is moderately active in some sections, but total business is below expectations. Automotive demand is steady, with completion of 1939 model buying in prospect shortly. Oil country goods still are retarded by quiet in drilling operations. Pressure tubing is somewhat less active than a month ago, with railroad requirements smaller.

Cleveland — Cast pipe backlogs are sustained, recent bookings having been in excess of production and giving some makers prospects of active operations for at least 30 days. Outlook for the entire quarter is good. Inquiries and orders lately have been made up of small lots but are holding well in the aggregate. Placing of most of 200 tons for Conneaut, O., bids recently, will be deferred until summer. Steel pipe shipments are fairly steady. Disposition of the Socony Vacuum tonnage leaves the line pipe market without any large lines actively pending.

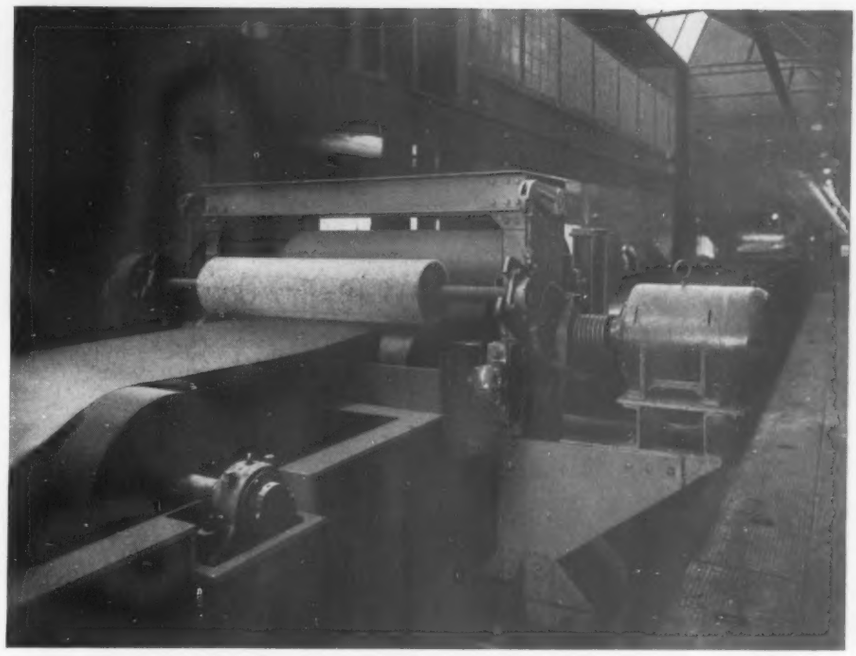
Boston—Cast pipe buying is heavier, but seasonal improvement in merchant steel pipe has been slight, although prices on the latter are steadier with secondary distributors. Led by slightly more than 1000 tons for Newport, R. I., cast pipe tonnage is bolstered by more small-lot purchases and slightly more interest by utilities. Wrought pipe moves slowly but steadily.

New York—The largest cast pipe inquiry in several years involves 14,000 tons, cement lined, 6 to 20-inch, to be bought by the department of purchase, New York, bids April 18. At least 800 tons of fittings also will be bought. Other inquiries are light and somewhat below normal for the season. Plumbing and heating contracts on several fairly large jobs continue held up, leaving the merchant pipe market without important developments.

Republic Steel Corp. and National Tube Co. are expected to furnish approximately 28,000 tons of 10-inch pipe for a line to be laid in Illinois and Ohio for Socony Vacuum Oil Co.

Birmingham, Ala.—Inquiries are

Cut Finishing Costs



...these Spiral Wound Brushes will help you do it!

DEPENDABLE, uniform finish on steel strip and tin plate is the goal of quality production plants. Don't overlook the brush which is the heart of the operation—make sure with Spiral Wound brushes of proved merit. Pittsburgh Plate Glass Company (Brush Division) brushes are delivering complete satisfaction in numerous big production plants.

Special Cooperation

These brushes are made with various fills, such as nickel-silver wire, tampico or horsehair—each with a specific purpose. Let our engineering representative show you how you can get uniformity and production. There's no obligation. Write or phone today.

PITTSBURGH
PLATE GLASS COMPANY
BRUSH DIVISION · BALTIMORE, MD.

more numerous, reports from local cast iron pipe plants indicate, and tonnage actually booked is in better volume than a few weeks ago, with the result that production, generally, is on a five-day basis.

Seattle—Demand is slow and no important new projects have come out. Bids were opened at Fort Lewis, Wash., April 13, for 200 tons of 10 and 12-inch cast iron pipe and fittings. Award of 115 tons of 4 to 8-inch cast iron for District No. 17, Seattle, is pending.

San Francisco — Cast iron pipe inquiries were limited to lots of less than 100 tons and only four projects involving 100 tons or more are pending.

Cast Pipe Placed

500 tons, various sizes, Newport, R. I., to R. D. Wood & Co., Florence, N. J.; Joseph DeCicio Co., Stoneham, Mass., general contractor.

100 tons or more, 12 and 14-inch, Swampscott, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

360 tons, 20-inch and under, Brookline, Mass.; bids April 21.

303 tons, national park service, Boulder City, Nev.; bids opened.

200 tons, 10 and 12-inch for Fort Lewis, Wash.; bids in.

125 tons, 6 and 8-inch for Kettle Falls, Wash.; bids April 20.

115 tons, 4 to 8-inch, District 17, Seattle; bids in.

Unstated, 12,000 feet 4 to 16-inch, sewage disposal plant, Seaside, Oreg.; alternates for transite and wood; bids April 28.

Steel Pipe Placed

28,000 tons, 10-inch line pipe, for Socony-Vacuum Oil Co. pipe line, to Republic Steel Corp., Cleveland, and National Tube Co., Pittsburgh.

Steel Pipe Pending

10,000 tons, 78-inch, Toledo, O., waterworks improvement; McGee Co., Minneapolis, low for general contract.

"This 2-line hook-on bucket, used where 2 hook blocks are available, is especially advantageous because:

It is a simple, rugged design having few parts—maintenance expense is low.

It is very easy for the crane operator to handle in picking up and discharging loads."

Blaw-Knox can meet your exacting requirements in bucket design. Send us your specification without obligation.

BLAW-KNOX *Digging and Rehandling* **BUCKETS**

BLAW-KNOX DIVISION
• OF BLAW-KNOX CO. •
Farmers Bank Bldg. · Pittsburgh, Pa.

Wire

Wire Prices, Page 89

Pittsburgh—Wire orders and production are steady. Automotive demand tends to moderate, and the end of buying for the 1939 model year is in prospect shortly. Buying lately has been steady, with orders small in order to keep stocks low. Merchant products continue to be bought in better volume, but while the peak of the agricultural season has not been reached, volume apparently will be less than hoped for. Prices on nails and other specialties are firm.

Cleveland — Wire sales have declined moderately so far this month, orders being smaller in both size and number. Manufacturers' wire demand is influenced by the slower pace among automotive parts makers, but activity in merchant products is fairly well sustained. The latter make a particularly favorable showing compared with the slow market a year ago. Shipments of fence posts to rural distributors also are relatively heavy.

Chicago—Demand for wire and wire products is slightly heavier though still at a relatively low level. Orders are coming from a broad list of consumers. Automotive requirements, however, are not encouraging.

Boston—Buying of wire products is light and spotty. Volume with some larger consumers, notably automotive, has been slow to develop. With little advance business on books, mills are asked for prompt delivery. Finishing schedules are uneven and closely linked with new releases. Buying of merchant wire

goods is light, resulting from coverage early in the year during a period of price competition.

New York — Wire buying is unchanged and slack. Little business is coming from automobile trade and consumption in several other large industries appears to be declining. Inventories are low, but manufacturers are apparently determined to keep them so for the present, specifying actual requirements for prompt delivery. Finishing operations are barely maintained at 50-60 per cent and operating schedules are irregular.

Birmingham, Ala.—Wire products are among the leaders, demand having held up exceedingly well over the first quarter and continues steady thus far in the second quarter.

Rails, Cars

Track Material Prices, Page 89

Placing of 1150 freight cars and nine locomotives by Missouri Pacific is the feature of the railroad equipment market. The Wabash has ordered four locomotives and Phelps Dodge Corp. four switchers. Of the 17 locomotives 14 are diesel-electric. The navy has postponed bids on 20 locomotives to April 18.

Department of commerce reports March shipments of locomotives, domestic and foreign, were 23, compared with 17 in February and 48 in March, 1938; first quarter deliveries were 63, compared with 99 for the same period in 1938. These figures do not include locomotives built in railroads' own shops.

Due to the coal strike the New York Central is delaying general distribution of steel for quarterly requirements. Recent opening of bids revealed a cut of $2 per ton by a small eastern platemaker. Quotations otherwise were firm.

Car Orders Placed

Missouri Pacific, 1025 coal cars and 125 box cars, to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; also coaches for two streamlined trains, to the American Car & Foundry Co. for construction at St. Charles, Mo.; includes two baggage and mail cars, two mail storage cars, two passenger coaches, two deluxe passenger coaches, two diner-barlounge cars and two parlor-observation cars.

United Carbon Co., ten 40-ton covered hopper cars, to American Car & Foundry Co., New York.

Locomotives Placed

Missouri Pacific, two 2000-horsepower diesel-electric locomotives and also five diesel switch engines, to the Electro-Motive Corp., La Grange, Ill., ahd one 1000-horsepower switch engine each to the American Locomotive Co., New York, and Baldwin Locomotive Works, Eddystone, Pa.

Phelps Dodge Corp., New York, four 1000-horsepower diesel-electric switchers, to Electro-Motive Corp., La Grange, Ill.

Wabash, three 600-horsepower switchers to Electro-Motive Corp., La Grange, Ill.; one 660-horsepower switcher to American Locomotive Co., New York.

Locomotives Pending

Navy, bids on 20 locomotives postponed to April 18.

Shapes

Structural Shape Prices, Page 88

Cleveland — Outstanding award, 1870 tons for the Carter road bridge here, was placed with Mt. Vernon Bridge Co., Mt. Vernon, O. Excluding a number of large bridge projects scheduled to appear for bids soon, inquiries have failed to record much improvement recently. Volume of private work is particularly light.

Pittsburgh—Structural awards are

DESIGNING ENGINEER
CHIEF ENGINEER
METALLURGIST
WORKS SUPERINTENDENT
Every key Man
IN YOUR ORGANIZATION
SHOULD HAVE THIS···
NELOY for Strength and Dependabilit
HERE ARE THE QUALITIES OF NEL
FLAME HARDENING
A SYMBOL OF THOROUGHBRE
Your COPY of the 24-page photographic inspection book showing NATIONAL-ERIE'S facilities for handling your steel casting specifications is awaiting your request. And your orders large or small will be handled promptly....
NATIONAL-ERIE CORPORATION
ERIE, PA. U. S. A.

holding up well, with an increasing number of projects coming out under private initiative. A new viaduct on Fifteenth street, Kansas City, Mo., will involve 4000 tons of structural shapes and plates, while 2000 tons will be required by the bureau of reclamation for a crossing at Sacramento, Calif.

Chicago—For the third consecutive week total pending structural tonnage has increased. Warmer weather is bringing out projects. While volume of minor tonnages is quite large, there are a number of substantial tonnages also pending.

Boston—I-beam bridges, Vermont, closing April 21, require close to 625 tons, while a viaduct, Providence, R. I., takes close to 1500 tons. Structural contracts are fewer, however, with 250 tons included for an aircraft factory building in Connecticut. Inquiry is also lower, notably for public buildings. Massachusetts highway program is held up by a contest over the budget. Fabricated prices continue weak.

New York—Structural activity is featured by the award of 3700 tons, state hospital buildings, Brentwood, N. Y., to Bethlehem Fabricators, Inc., Bethlehem, Pa. and an additional 6500-ton contract for miscellaneous material, mostly structural steel tunnel supports for another section, Delaware river aqueduct. New inquiry, led by 1200 tons for a school addition, Erasmus hall, Brooklyn, closing April 19, is slightly less active with bids in on close to 1000 tons for New Jersey state bridges.

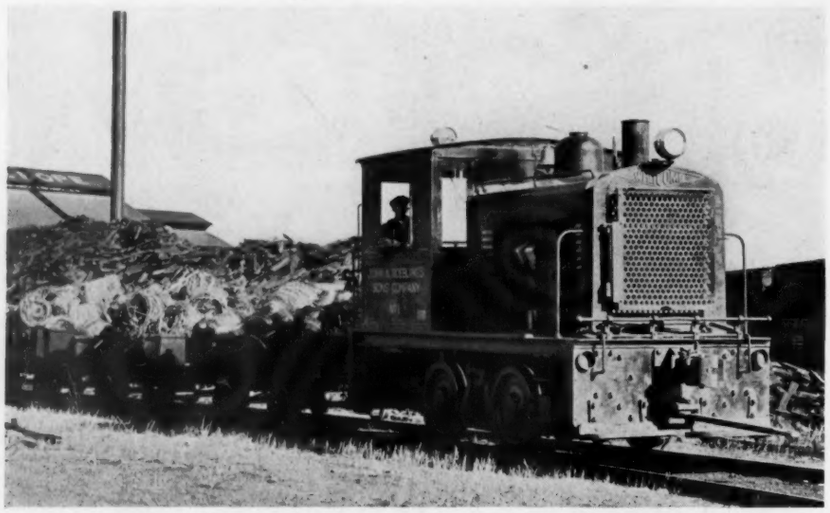
Philadelphia — Despite general sluggishness, construction requirements include a few fair size tonnages. Fort Pitt Bridge Works; Pittsburgh, booked 2200 tons for an apartment building here, through Turner Construction Co. In an adjacent district 3000 tons have been awarded for the American Celanese Corp. plant, Narrows, Va., to Virginia Bridge Co. Pending work includes 1200 tons for the state liquor control building, Harrisburg, Pa.; McCloskey & Co., Philadelphia, general contractor.

Buffalo—New life was injected into the structural market here with the announcement that three substantial private projects would get underway in the near future. Added to these projects are numerous government financed jobs, two calling for large tonnage, on which bidding dates have been announced.

Seattle—New projects are developing slowly and prospects are less promising than in the first quarter. The larger shops have a fair amount of work in hand. Local plants are figuring on 1700 tons for the Ballard bridge, Seattle, which may go either concrete or steel.

San Francisco—While volume of inquiries remain substantially unchanged, a fair sized booking of structural shapes aggregating 6659 tons, were reported. This brought the total to date to 43,529 tons, compared with 43,529 tons in 1938.

St. Louis—Interest in structurals centers in the Fifteenth street, viaduct, Kansas City, Mo., involving 3500 tons of structurals and 496 tons of welded trusses, bids due April 15. Several small projects have



SWITCHING ECONOMY

This 30-ton Whitcomb Diesel-Mechanical locomotive is assigned to regular interdepartmental work in connection with Hot Mill operation at the plant of John A. Roebling's Sons at Roebling, N. J.

The complete locomotive line of Baldwin and Whitcomb permits us to offer unbiased recommendations as to the type of power best suited to your conditions. Without obligating you our engineers will survey your requirements and estimate the savings you can expect from Whitcomb power.

The Whitcomb Locomotive Company (Plant at Rochelle, Illinois). All Sales and Engineering by The Baldwin Locomotive Works, Paschall Post Office, Philadelphia, Penna.

CHOOSE YOUR TYPE OF POWER
Gasoline or Diesel Mechanical Drive
Gasoline or Diesel Electric Drive
Electric Storage Battery
Electric Trolley

WHITCOMB LOCOMOTIVES
SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

Shape Awards Compared

	Tons
Week ended April 15	36,266
Week ended April 8	15,805
Week ended April 1	32,489
This week, 1938	19,556
Weekly average, year, 1938	21,566
Weekly average, 1939	25,522
Weekly average, March	21,240
Total to date, 1938	242,734
Total to date, 1939	357,313

Includes awards of 100 tons or more.

been closed, the largest a postoffice garage here requiring 240 tons, awarded to Atlas Iron Works, St. Louis.

Shape Contracts Placed

4210 tons, south side vocational school, Chicago, to Duffin Iron Co., Chicago.

3700 tons, building, Pilgrim state hospital, Brentwood, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; Turner Construction Co., New York, general contractor.

3025 tons, 444 transmission towers, TVA 197824B, Middletown, Tenn., to American Bridge Co., Pittsburgh.

3000 tons, tunnel ribs, inner lining, bars and miscellaneous material, sewer, two contracts, Boston Metropolitan district project, Everett-Chelsea, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Silas Mason Co., New York, general contractor.

3000 tons, plant building, American Celanese Corp., Narrows, Va., to Virginia Bridge Co., Birmingham, Ala.

2200 tons, apartment building, Philadelphia, to Fort Pitt Bridge Works, Pittsburgh; through Turner Construction Co., Philadelphia.

1870 tons, Carter road bridge, Cleveland, to Mt. Vernon Bridge Co., Mt. Vernon, O.

1345 tons, 195 transmission towers, TVA 197824A, Florence, Ala., to American Bridge Co., Pittsburgh.

1220 tons, substations and transmission towers for river crossings, Bonneville dam, Oreg., to Bethlehem Steel Co., San Francisco.

1000 tons, infirmary buildings, mental school, Willowbrook, N. Y., for state, to Belmont Iron Works, Philadelphia.

1000 tons, garage, Brooklyn, N. Y., to American Bridge Co., Pittsburgh; through procurement division, treasury department, New York.

890 tons, auditorium, Michigan State University, Lansing, Mich., to Fort Pitt Bridge Works, Pittsburgh.

820 tons, bridge, Sumter county, South Carolina, to Virginia Bridge Co., Roanoke, Va.

600 tons, alterations municipal pier No. 99, North river, New York, to American Bridge Co., Pittsburgh; through Lynn Construction Co. Inc.

461 tons, highway bridge, Winfield, Kans., to Kansas City Structural Steel Co., Kansas City, Kans.; through List Construction Co.

450 tons, Kansas Light & Power Co., power house, Abilene, Kans., to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

400 tons, bridge, New York Central railroad, Yonkers, N. Y., for Westchester county park commission, to American Bridge Co., Pittsburgh.

380 tons, addition to postoffice and court house, Los Angeles, to Consolidated Steel Corp., Los Angeles.

350 tons, factory addition, for United Aircraft Corp., Stratford, Conn., to Truscon Steel Co., Youngstown, O.

350 tons, school, Wappinger Falls, N. Y., to unstated fabricator; John Eisele Co., New York, general contractor.

335 tons, school, Wappiners Falls, N. Y., to American Bridge Co., Pittsburgh.

310 tons, two dry dock cranes, for navy, Bedford, O., to Fort Pitt Bridge Works, Pittsburgh; through R. W. Kaltenbach Corp., Bedford, O.

300 tons, stage, Universal Picture Corp., Los Angeles, to Bethlehem Steel Co., Los Angeles.

300 tons, city hall and community building, Emporia, Kans., to W. R. Grimshaw Construction Co., Tulsa, Okla.

290 tons, juvenile court building, Washington, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, apartment, Wynnewood, Pa., to Belmont Iron Works, Philadelphia; through Nelson Pedley Inc., Philadelphia.

260 tons, bottling plant, for Coca Cola Bottling Co., Worcester, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

260 tons, dormitory building, Connecticut state college, Storrs, Conn., to Haarmann Steel Co., Holyoke, Mass.

250 tons, addition to building, for Frank R. Jelleff Inc., Washington, to Barber & Ross Co. Inc., Washington.

240 tons, St. Louis postoffice garage, to Atlas Iron Works, St. Louis; through J. S. Alberici, St. Louis.

230 tons, junior-senior high school, Sinclairville, N. Y., to Buffalo Structural Steel Co., Buffalo.

230 tons, plant addition, General Baking Co., 144th street, New York, to Bethlehem Fabricators, Bethlehem, Pa.

225 tons, school, Cassadage Valley, N. Y., to Buffalo Structural Steel Co., Buffalo.

215 tons, railroad bridge, Mosell, Mo.,

WATCHDOGS of DOOR COSTS

Kinnear Rolling Doors are mighty tough customers when it comes to protecting doorways and door costs. Dependable watchdogs . . . constantly on guard against inefficiency! And their blue-ribbon performance has been proved in continuous daily service over a period of more than forty years.

Opening upward and coiling compactly above the lintel, Kinnear Doors save valuable floor and wall space. They stay out of the way when open . . . out of reach of accidental damage by trucks and cars, or wind. Their rugged all-steel construction and interlocking-slat design assure exceptional durability. They will not sag, warp, split or pull apart, and they protect against fire, vermin, burglary and the elements. All of which mean **lower** operating and maintenance costs! Every Kinnear Rolling Door is specially built, for manual or electrical operation, to exactly fit the opening for which it is intended. That helps to keep installation costs at the very lowest. And remember, Kinnear Door Service is backed by a nationwide organization of specialists in the designing and building of upward-acting doors. Take advantage of Kinnear's complete door service . . . Write today for details or recommendations to fit your own problems!

The KINNEAR Manufacturing Co.
1780 - 1800 FIELDS AVE., COLUMBUS, OHIO
Offices and Agents in All Principal Cities
FACTORIES: COLUMBUS, OHIO — SAN FRANCISCO, CAL.

to Stupp Bros. Bridge & Iron Co., St. Louis.

210 tons, Thomas Jefferson memorial, Washington, to Fort Pitt Bridge Works, Pittsburgh.

200 tons, bridge section 6-VF, Madison county, Mitchell, Ill., to Missouri Bridge & Iron Co., St. Louis.

195 tons, bridge 1541, Nicholas county, West Virginia, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

180 tons, St. Louis, Chippeway street underpass, to Stupp Bros. Bridge & Iron Co., St. Louis; through Stiers Bros. Construction Co.

165 tons, bridge over Boston & Maine railroad, Bernardstown, Mass., for state, to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bridge, section 5-VF, Madison county, Mitchell, Ill., to Vierling Steel Works, Chicago.

155 tons, state bridge, Bernardston-Greenfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, warehouse, S. S. Pierce Co., Boston, to New England Structural Co., Everett, Mass.

140 tons, fat rendering building, Philadelphia, to Hess Iron Works Inc., Philadelphia.

135 tons, guard rail, Major Degan boulevard, Bronx, New York, to North American Iron & Steel Co., Brooklyn, N. Y.

125 tons, Santa Maria river bridge, Yavapai county, Arizona, to unnamed interest.

125 tons, stage, Paramount Picture Corp., Los Angeles, to Bethlehem Steel Co., Los Angeles.

125 tons, bridges, Kansas and Missouri, for Missouri Pacific railroad, to American Bridge Co., Pittsburgh.

110 tons, reconstruction of bridge R-94, Rochester, Minn., for Chicago Great Western railroad, to American Bridge Co., Pittsburgh.

100 tons, 3-span WF beam bridge, Wardsboro-Jamaica, Vt., to American Bridge Co.; Carlo Bianchi & Co. Inc., Framingham, Mass., general contractor.

Shape Contracts Pending

6000 tons, Shasta dam towers, bureau of reclamation, Redding, Calif.

3500 tons of shapes and 495 tons of welded trusses, for Fifteenth street viaduct, Kansas City, Mo.; bids April 15.

3000 tons, Southern Pacific railroad bridges, Central Valley, Calif.; bids April 21.

2500 tons, new convention hall, costing $2,700,000, Buffalo; bids May 2.

1700 tons, Ballard bridge, Seattle, (alternate concrete); bids to board of public works, May 4.

1500 tons, vehicular tunnel, Mobile, Ala.; bids in.

1200 tons, building, state liquor control bureau, Harrisburg, Pa.; McCloskey & Co., Philadelphia, general contractor.

1200 tons, addition, Erasmus hall school, Brooklyn, N. Y., for board of education.

1200 tons, Kleinhans Music hall, costing $1,200,000, Buffalo; bids May 9.

800 tons, Doney creek bridge, Central Valley project, Calif.; bids April 21.

625 tons, grade crossing, Northern boulevard, Queens, N. Y.

600 tons, Nazareth hospital, Philadelphia; McCloskey & Co., Philadelphia, general contractor.

550 tons, social security building, Washington.

500 tons, club house, for Madison Square Boys' club, New York.

500 tons, bridge reconstruction, Hood river, Oreg.; bids April 24.

500 tons, new store, W. T. Grant Co., Buffalo; bids April 24.

500 tons, Commodore Perry housing project, Buffalo; bids April 27.

450 tons, ward 2, Gallinger hospital, Washington, for District of Columbia.

450 tons, vocational high school, McKeesport, Pa.

400 tons, central school, Clyde, N. Y.; Sauke Bros., Rochester, N. Y., low.

400 tons, Harlem Boys' club, New York.

325 tons, boiler house, Niagara, Wis., for Kimerly-Clark Corp.

325 tons, roof trusses, Manitowoc, Wis., for unstated owner.

300 tons, Taylor overpass, Washington; Harry Dickens, Philadelphia, low.

300 tons, boiler house, Niagara, Wis.

300 tons, state bridge, Kremmling, Colo.

264 tons, bridge, Grand county, Colorado; bids in.

250 tons, school, Eden, N. Y.; bids April 27.

220 tons, highway bridge, Tillamook, Oreg.; bids in.

205 tons, state bridge, Trinidad, Colo.

200 tons or more, four high transmis-

DEPENDABLE SERVICE QUALITY

1906 33 years 1939

DAMASCUS MANGANESE AND ALLOY CASTINGS

Manganese and Alloy Steel Castings One Half to One Thousand Pounds Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

sion towers over Willamette river, Oreg., for Bonneville authority; Steel Construction Co., Portland, Oreg., low.

200 tons, school, Chagrin Falls, O.; Gilmore, Carmichael & Olson Co., Cleveland, low.

200 tons, building, Bridgeport, Conn., for unstated owner.

185 tons, men's dormitory, state university, Columbus, O.; Skelken Bros., Columbus, low.

156 tons, Washington state bridge at Renton; bids in.

153 tons, state Sixth avenue N. E. undercrossing, Seattle; bids in.

150 tons, power house addition, Tide Water Oil Co., Bayonne, N. J.

125 tons, addition to foundry building, Chicago, for unstated owner.

125 tons, bridge, Sandune, Tex., for International Great Northern railroad.

125 tons, highway bridge, Somerset, Pa., for Pennsylvania Turnpike commission.

125 tons, grade and high school, Red Creek, N. Y.

125 tons, building addition, for Joseph E. Seagram & Son, Louisville, Ky.

118 tons, bridges for Alaska road commission; bids in at Seattle.

115 tons, factory building, for Coca Cola Bottling Co., Glens Falls, N. Y.

Unstated, two 5-span state bridges in Montana; bids in.

Reinforcing

Reinforcing Bar Prices, Page 89

Pittsburgh—Reinforcing bar markets are holding steady, with both prices and demand firm. Inquiries are about equal to the placements, and an increase in privately financed jobs has been noted. Current prices range around 1.90 cents base in most districts, with little weakness below that point noted. One exception is southern Ohio, where a few scattered jobs are reported below that figure.

Cleveland—Inquiries include 1200 tons for the Valley View and Luna park housing projects here. Bids on the former project go in April 28, while no date has been set for the latter. Private work is slow. Operations among local fabricators are irregular, with backlogs substantially cleared. Prices continue weak.

Chicago—Demand has been substantially heavier than for other lines of steel commodities the past few weeks. Aided by spring construction activities, awards have tended upward. However a tapering in demand is reported with new jobs slowing down in volume and tonnage. Largest of new inquiries is another Chicago subway section to be bid soon.

Boston—Small-lot buying tends upward while 500 tons have been placed for a dike wall and sewer, Springfield, Mass. Recently, sewer requirements have been outstanding. Bridge needs and engineering projects lag. Prices are slightly steadier.

New York—Awards are heavier, including 3000 tons for a section of the East River drive, New York, going to a Pittsburgh district mill. Inquiry in the east is led by close to 9000 tons for two government buildings, Washington, bids close April 26.

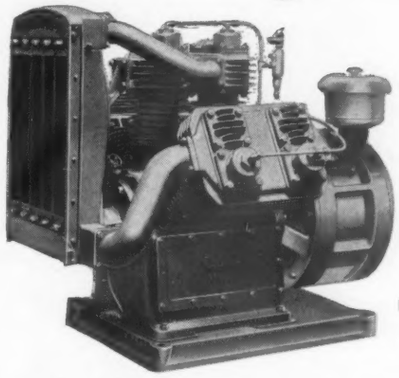
Philadelphia—Demand is dominated by 9000 tons for the social se-

Concrete Bars Compared

	Tons
Week ended April 15	10,900
Week ended April 8.....	3,852
Week ended April 1.....	11,872
This week, 1938	12,772
Weekly average, year, 1938	6,959
Weekly average, 1939	11,263
Weekly average, March....	10,279
Total to date, 1938	81,723
Total to date, 1939	157,689

Includes awards of 100 tons or more.

WORTHINGTON AIR COMPRESSORS
for shops demanding the best equipment



Capacities to 445 cu. ft. per min.
Pressures to 200 lb. per sq. in.
Tank mounted or on plain base
Electric motor or gasoline engine drive
LARGER CAPACITIES ALSO AVAILABLE

THE selection of a Worthington Compressor eliminates all compromise with quality. The types here shown are but representative of an extensive line providing the exact unit... with correct drive... for every individual condition requiring a medium air supply.

There's a Worthington Dealer near you • *Literature on request*

WORTHINGTON PUMP AND MACHINERY CORPORATION

ATLANTA BOSTON BUFFALO CHICAGO CINCINNATI CLEVELAND DALLAS DENVER DETROIT EL PASO HOUSTON KANSAS CITY

General Offices: HARRISON, NEW JERSEY

Representatives in Principal Cities of Foreign Countries

LOS ANGELES NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS ST. PAUL SAN FRANCISCO SEATTLE TULSA WASHINGTON

Behind the Scenes with STEEL

What Price Prosperity?

■For the last week or so we've been moody and lethargic. This damned European situation is enough to drive a guy to distraction, business and the stock market both seem to need a spring tonic of sulphur and molasses, and the last two or three movies we've seen were pretty lousy. What's more, we've spent so much time and energy wrestling with Lady Temptation to keep from smoking that we're just about done in. That is, we were until A. H. Friese, president of Welding Engineering Co. up in Milwaukee shamed us into some optimistic enthusiasm with this letter just received: "We certainly like your magazine STEEL. We are swamped with orders, really. In February and March I completed a four week trip through the west establishing three offices. During the last of March I flew the Central states from Minneapolis to Houston and opened five more new offices. Today I fly east to open five more, believe it or not." We ask you, when's a man like that going to find any time for a good tough game of Chinese checkers.

Phoney Photo Phellows

■ Every so often we have to run up the warning flag about this or that photographer who is making the rounds of our good readers, telling them they are the official representatives of STEEL or the Penton Publishing Co Once again we say, "T'ain't so!" If anyone tries to put the bee on you with this kind of a tale, don't write—telegraph our nearest office.

Railroad Ripley

■ A believe it or not in the railroad industry came to our attention recently out in Chicago. It is a road that carries no passengers or freight, has very little equipment but still operates consistently at a profit. This railroad Ripley is the Indiana Harbor Belt Line which maintains 628 miles of track in the Chicago metropolitan area. As you may realize, no railroad runs through Chicago and this accounts for the unusual position held by the belt line. Its rolling stock is all locomotives and cabooses and each year it switches over a million cars from the terminus in Chicago to one of the other lines.

Last Chance

■ That sponge iron story last week seems to have created quite a stir and we have just a handful of overruns left on the stockroom shelves. Also available are a few copies of the financial analysis so if you want either one just drop us a note.

Thank You, Fred

■ Our most regular and faithful correspondent, Fred Chambers of Luckey, Ohio and the National Gypsum Co. last week sent Ann three good old-fashioned balloons with her name very prettily printed on each one. Two of them have already gone the way of all good balloons but she did want to drop in this thank-you note if we may.

Combination Honeymoon

■ Apparently there was a salesman (one of our own it is rumored) who was recently married and decided to honeymoon in a part of his regular territory. After a few days a note to the home office explained the appearance of some orders and reports from him which were totally unexpected. You see, he wrote, I figured that while we were up in this neck of the woods, I'd squeeze in a few calls between squeezes.

Like the Duce

■ Have you heard why Herr Hitler has been drinking so much Italian beer lately?

SHRDLU

curity and railroad retirement bureau buildings, with bids opening April 26. Two sections of the Pennsylvania all-weather highway are also up for bids section A-2, comprising 1¾ miles, to be opened April 27 and section KB-2, comprising 2½ miles, April 28.

Seattle—More than 4000 tons are involved in two Seattle building projects, the federal courthouse and Ballard bridge, to be placed within the next month. N. P. Severin, Chicago, is low at $1,227,000 for the former job, which will require about 1700 tons. Seattle has called bids May 4 for the Ballard span, 3367 feet long which will involve about 2500 tons with alternates for structurals, about 1700 tons.

San Francisco—New inquiries appear slowly and awards are not particularly heavy, totaling only 2113 tons and bringing the aggregate for the year to 58,927 tons, compared with 26,966 tons last year. Bethlehem Steel Co. took 950 tons for a science building for a junior college in San Francisco.

Reinforcing Steel Awards

3000 tons, contract 6. East River drive, New York, to Carnegie-Illinois Steel Corp., Pittsburgh; J. Rich Steers Inc., New York, general contractor.

2220 tons, for Coulee dam, to Bethlehem Steel Co., Seattle.

950 tons, science building, junior college, San Francisco, to Bethlehem Steel Co., San Francisco.

390 tons, reconstruct stilling basin, Calaveras dam, Sunol, Calif., to Soule Steel Co., San Francisco.

390 tons, including 200 tons joists, high school, Gloucester, Mass., to Truscon Steel Co., Youngstown, O.

385 tons, dike flood wall, Springfield, Mass., to Concrete Steel Co., Boston; John O'Connell's Sons Co., Holyoke, Mass., general contractors.

300 tons, men's dormitory quadrangle, Ohio State university, Columbus, O., to Pollak Steel Co., Cincinnati, O., through Hausman Steel Co.

285 tons, including 130 tons steel joists, school, Wappinger Falls, N. Y., to Ceco Steel Products Corp., Jersey City; John Eisele Co., New York, general contractor.

260 tons, school, South Bend, Ind., to Ceco Steel Products Corp., Chicago.

240 tons, sewage disposal plant, Lancaster, O., to Pollak Steel Co., Cincinnati.

220 tons, superstructure of viaduct, South Laramie avenue, Chicago, to Inland Steel Co., Chicago.

220 tons, St. Louis, Banneker school, to Sheffield Steel Corp., Kansas City; through Kellerman Construction Co., St. Louis.

200 tons, music hall, Purdue university, West Lafayette, Ind., to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.

200 tons, municipal building, Emporia, Kans., to Missouri Rolling Mill Corp., St. Louis.

200 tons, warehouse, S. S. Pierce Co., Boston, to Concrete Steel Co., Boston.

200 tons, bridge, Rock Island-Davenport,

Iowa, to Inland Steel Co., Chicago.

189 tons, treasury department, invitation 52,879, Los Angeles, to Bethlehem Steel Co., Los Angeles.

170 tons, sewage plant, Peru, Ind., to Republic Steel Corp., Cleveland.

158 tons, auditorium, Marina junior high school, San Francisco, to W. C. Hauck & Co., San Francisco.

150 tons, addition, Cambridge high and and latin school, Cambridge, Mass., to Concrete Steel Co., Boston; Rugo Construction Co., Boston, general contractor.

150 tons, building, Century Distilling Co., Peru, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, highway, North Adams-Williamstown, Mass., to Truscon Steel Co.; Central Construction Co., Lawrence, Mass., general contractor.

103 tons, library and administration building, University of California, Davis, Calif., to W. S. Wetenhall Co., San Francisco.

100 tons, bridge, South Damen avenue, Chicago, to Concrete Steel Co., New York.

100 tons, various local building projects, Seattle, to Seattle Steel Co., Seattle.

Reinforcing Steel Pending

9000 tons, social security and railroad retirement buildings, Washington; bids April 26.

2500 tons or more, Ballard bridge, Seattle; bids to board of public works, May 4; alternate plans for shapes.

1700 tons, federal courthouse, Seattle; N. P. Severin, Chicago, low.

600 tons, Valley View housing project, Cleveland; bids April 28.

600 tons, Luna Park housing project, Cleveland; no bidding date set.

525 tons, dormitory, Northwestern university, Evanston, Ill.

500 tons, western regional building, department of agriculture, San Francisco; bids soon.

465 tons, highway projects, Putnam and Nassau counties, New York, E. A. Ottaviano Inc., Croton-on-Hudson, N. Y., and Good Roads Contracting & Engineering Co., Wantagh, N. Y., general contractors.

450 tons, new convention hall, Buffalo; bids May 2.

400 tons, Commodore Perry housing project, Buffalo; bids April 27.

400 tons, contract 4, sewer, Queens, N. Y.

325 tons, Taylor overpass, Washington; Harry Dickens, Philadelphia, low.

300 tons, bridge, route 72, section 119, Ogle county, Illinois.

250 tons, new store, W. T. Grant Co., Buffalo; bids April 24.

250 tons, Kleinhans Music hall, Buffalo; bids May 9.

223 tons, section 4A, Pennsylvania turnpike commission, Westmoreland county; bids April 14.

220 tons, Coca Cola bottling plant, Philadelphia; Wark Co., Philadelphia, general contractor.

220 tons, state bridge Tillamook county, Oregon; Jacobsen-Jensen Co., Portland, low.

208 tons, sections 16A and 17A, Pennsylvania turnpike commission, Fulton county; bids April 14.

204 tons, state highway letting FA-205-AGS, Frankfort, Ky.; bids April 12.

200 tons, contract MC-39-11, circumferential highway, New York; bids April 18.

175 tons, new school, Clyde, N. Y.; Sauke Bros., Rochester, N. Y., low.

156 tons, public school building, New Orleans; bids April 3.

150 tons, state liquor control bureau, Harrisburg, Pa.; McCloskey & Co., Philadelphia, general contractor.

150 tons, orphanage, Order of Sons of Italy, Concordville, Pa.; bids April 15.

150 tons, Ward Gallinger hospital, Washington; bids April 18.

140 tons, Lake street viaduct, San Francisco; Union Paving Co., Babcock building, San Francisco, low.

137 tons, two bridges, Santa Clara county, California, for state; Dan Caputo, San Jose, Calif., low.

130 tons, Wellston, Mo., high school; Fleischer-Sieger Construction Co., St. Louis, awarded general contract.

110 tons, Nazareth hospital, Philadelphia, McCloskey & Co., Philadelphia, general contractor.

106 tons, public school building, Davenport, Ia.; bids April 13.

100 tons, highway bridge over Levisa river, Buchana county, Virginia; Haley, Chisholm & Morris Inc., Charlottesville, Va., low bidder.

Unstated tonnage, two sections, A-2 and KB-2; bids April 27 and 28, respectively.

Unstated tonnage, Rock creek sewage project, Washington; James Lombardi, Philadelphia, low.

Semifinished

Semifinished Prices, Page 89

Pittsburgh—Movement of semifinished steel continues to vary widely from week to week, but the April total apparently will fall below March. Part of this is due to the

● Page Hi-Tensile "F" is an all purpose electrode—fast running, easy handling. It gives a weld of great strength and ductility. Equally good in all positions on production, maintenance and shop welding.

Page Hi-Tensile "F" operates on straight polarity. It has unusually low spatter and slag loss. A great favorite for high-speed, single-pass welding—and for jobs in Cro-man-sil, Corten, H-T-50 and other new alloy steels. . . . See your local Page distributor. He may be able to make helpful suggestions.

BUY ACCO QUALITY *in Page Welding Electrodes, Lay-Set Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Cutting Machines, American Chains and Ford Chain Blocks.*

PAGE STEEL AND WIRE DIVISION • **MONESSEN, PENNSYLVANIA**

TRADE MARK

AMERICAN CHAIN & CABLE COMPANY, Inc.

AMERICAN CHAIN DIVISION • AMERICAN CABLE DIVISION • ANDREW C. CAMPBELL DIVISION • FORD CHAIN BLOCK DIVISION • HAZARD WIRE ROPE DIVISION • HIGHLAND IRON AND STEEL DIVISION • MANLEY MANUFACTURING DIVISION • OWEN SILENT SPRING COMPANY, INC. • PAGE STEEL AND WIRE DIVISION • READING-PRATT & CADY DIVISION • READING STEEL CASTING DIVISION • WRIGHT MANUFACTURING DIVISION • IN CANADA: DOMINION CHAIN COMPANY, LTD. • IN ENGLAND: BRITISH WIRE PRODUCTS, LTD. • THE PARSONS CHAIN COMPANY, LTD. • *In Business for Your Safety*

letdown in sheet and strip production, although tin plate needs are tempering the decline. Wire rod output shows little change, with skelp slightly less active.

Pig Iron

Pig Iron Prices, Page 90

Pittsburgh—Pig iron releases and new business are slower. Operations of some large melters are steady, while jobbing foundries remain fairly active. Radiator manufacturers are carrying heavy stocks of finished products, although business has expanded steadily so far this year. Sanitary ware makers also show fairly good shipments despite less improvement than expected from new construction. Coke movement has declined, partly because of the season. Stocks of coke and coking coal are adequate, and little possibility of a shortage is seen, even if the coal strike is protracted.

Chicago—Shipments are about 15 per cent behind the first half of March, both in pig iron and by-product foundry coke. Early estimates indicated a slight decline in tonnage for April, but these may have to be revised, as present rate of movements is below expectations. Sales are irregular, most consumers already being on the books for second quarter needs. Foundry melt is slowing, automotive demand having tapered. Agricultural casting requirements are well maintained but seen as likely to drop off in another 30 days.

Cleveland—A small decline, possibly 10 per cent, is indicated for pig iron shipments this month. Foundry operations are spotty, producers of automotive parts being less active, while some jobbing plants are busy on miscellaneous work. Certain melters are unusually cautious in stock acquisitions, pig iron releases being deferred until supplies are exhausted. As a result, sellers are unable to schedule shipments far ahead. New business is slow, with small lots predominating.

Boston — Pig iron buying continues to drag, mostly in small lots in districts affected by the recent truck strike, notably in Rhode Island. On the whole foundry melt has failed to improve, with a few exceptions, notably the district cast pipe foundry. Close to 1000 tons of Indian iron is expected at Boston and Bridgeport this week.

New York — Extreme dullness marks pig iron trading. However, consumer stocks are low and will require additions in the event of better casting demand. Specifications from manufacturers of soil pipe, machinery and hardware comprise the principal activity. The New York state barge canal has opened its navigation season, permitting water shipments from Buffalo furnaces.

Philadelphia—Shipments are light but are in excess of new orders. In view of some second quarter contracting last month it is not surprising that new orders are lagging, but lack of improvement in consumption is disappointing. The Birdsboro, Pa., stack is expected in operation shortly.

Buffalo—Pig iron deliveries are off slightly from the rate a month ago, despite a small gain in operations of some foundries. Sellers are encouraged by low inventories of consumers as well as by small stocks of casting users. Pig iron production holds at 57 per cent.

Cincinnati—Early-April shipments of pig iron, both northern and southern, held close to March levels, but specifications for the remainder of this month indicate a slowing down in demand. Melters continue conservative, in buying and in shipping orders, most foundries being without backlogs.

The market shows confidence that early expansion in seasonal lines will offset the present tapering tendency in the melt. Demand for castings from machine tool builders is unaffected.

St. Louis—Shipments are holding fairly well, but new business is quiet, partly because large lots still are due against previous contracts. Operations of stove, heating equipment and farm implement makers show little change since a month ago, but seasonal improvement in activity of stove foundries is absent. Backlogs and production of steel foundries are off slightly.

Birmingham, Ala.—Output of pig iron is unchanged with 14 furnaces in blast. Melters describe shipments at the moment as fair and volume of bookings are satisfactory.

Toronto, Ont.—The week's sales dropped below 1000 tons, a new low for the year. Buying is largely for spot needs, with forward contracting negligible. Uncertainty over the outlook and expectations of unchanged prices are retarding coverage of future requirements.

Ferroalloys

Ferroalloy Prices, Page 90

New York — Ferromanganese shipments show little change, but with ingot production declining a reduction in total movement for the month is indicated. Domestic prices are steady, while quotations on imported material are firmer. This is attributed to withdrawal of offerings from what was formerly Czechoslovakia. Shipments from that area now are subject to the higher duties that apply to German territory, making prices too high to be competitive. Spiegeleisen specifications and prices are unchanged.

KIDD

DRILL ROD
COLD DRAWN SHAPES

Give us the opportunity to demonstrate that accurate drawing, smooth defect-free finish, expert heat treatment and careful inspection are "built in" to any and every Kidd drawn product, standard or special.

41 Years of Experience!

Ask for the decimal equivalent chart

KIDD DRAWN STEEL CO.
Aliquippa, Pa.
(Pittsburgh District) *Phone: Aliquippa 196*

Scrap

Scrap Prices, Page 92

Pittsburgh—No. 1 heavy melting steel is down 50 cents to $15 to $15.50 on broker offerings at this level. One sale of a small tonnage has been reported and other larger tonnages are believed pending. Offerings still are not large, the easier market being due to lack of buying and to influence of weakness in other districts, rather than to accumulation of distress material.

Cleveland — Inactivity in scrap trade is resulting in a cut of about 50 cents a ton on some grades, including blast furnace material, No. 2 busheling, cast, forge flashings and hand bundled sheets. No. 1 heavy melting now is $14 to $14.50, and No. 2 is $13 to $13.50, and pressed sheets $14 to $14.50.

Some small sales have been made at the new levels, but most current activity is confined to routine shipments.

Closing of the New York Central railroad list is said to have resulted in a steelmaker in southwestern Ohio paying $15.25 for heavy melting steel, the remainder going for export at around $16.

Chicago—Scrap prices have declined sharply. No. 1 heavy melting steel is off $1.50 on a sale at $13, while other grades have weakened in relative amount. Quotations had been largely nominal during an extended period of inactive demand from mills. Upward of 8000 tons was involved in the latest purchase, it is estimated.

Boston—Prices of some scrap grades are lower, including chemical borings and stove plate for eastern Pennsylvania delivery and No. 1 machinery cast for district delivery. Yard dealers still are paying $8 for unprepared heavy steel, reflecting the firm export situation. One broker has dropped his export price 25 cents, paying $13.75 as top for No. 1, dock, and $12.50 for No. 2.

Philadelphia—The scrap situation is mixed. Sentiment is easier, but material is not coming out freely and prices generally are unchanged. A continued heavy movement abroad is bolstering prices on heavy melting steel. Stove plate is down to $13, consuming point, on a recent district sale.

Detroit—Absence of buying interest on the part of mills and brokers has been accompanied by further reductions in prices of 25 to 50 cents. Dealers believe it will be another week or two before any definite signs of a firmer market develop. Industrial heavy melting is off 50 cents, as also are flashings and short rails.

Buffalo—Despite absence of large sales, local scrap prices are down 25 cents, with No. 1 heavy melting steel $13.50 to $14. Reductions reflect the purchase of 5000 tons, mostly No. 1 bundles, by a leading consumer, on the basis of the lower range for No. 1 material.

Cincinnati—Scrap is weaker and prices are nominal although unchanged. Demand is quiet and recent bids on railroad offerings were lower than last month. Mills appear well supplied with scrap for current needs.

St. Louis—The market is at almost a complete standstill, with the tone weak. Prices have been reduced on several grades. Inquiries as well as orders are absent, with mills and foundries awaiting clarification of the business situation before making commitments. Light offerings are holding distress scrap to a minimum. A steady flow continues to consumers against old contracts.

Birmingham, Ala.—The market is inactive, with prices showing evidence of weakness.

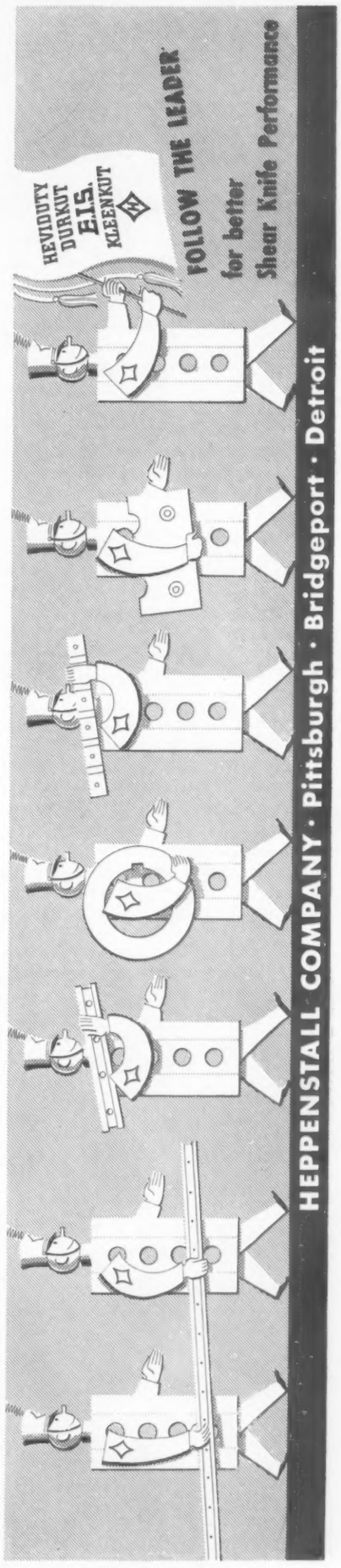
Seattle — Agitation against exports of metals, and picketing of ships loading scrap at Pacific coast ports have caused Japanese buyers to limit purchases in this area. Local dealers report some new orders from the Orient but not in the volume expected. Export prices are firm at $14.50 for No. 1 melting, or slightly higher. Local rolling mills are a factor in the market, paying about $11 and $12 for No. 2 and No. 1 respectively.

Toronto, Ont. — A stronger market has developed here, with prices of most grades up 25 cents a ton. Dealers indicate better sentiment and expectations of improved business as responsible for the upturn. No. 1 machinery cast and heavy melting steel are in good demand, with yard supplies small. No. 2 cast also is active, but increased offerings are looked for soon.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

Bolt, nut and rivet demand shows occasional gains. Improvement is entirely in specifications against old orders, since new business is lagging. Automotive releases are slower, but construction projects involve heavier shipments. Considerable new ship work is in prospect for the next several weeks. Cap screw manufacturers are benefiting from better activity among machinery builders.



Warehouse

Warehouse Prices, Page 91

Cleveland—Warehouse sales have tapered moderately, influenced by some decrease in consumption and by a more cautious attitude among buyers. Prospects for a pickup later this month have been dimmed by impaired sentiment among warehouse customers.

Chicago—Business to date this month is well ahead of the March period, though the comparison is with the poorer half of last month. Nevertheless, a favorable record for April is in prospect. Orders are widely diversified.

Boston — Volume this spring has been disappointing, notably in the Boston metropolitan district. A few outside jobbers, at Hartford especially, are making slightly better showing. Buying is well diversified as to products. Cold-finished bars and galvanized sheets have been reduced 25 cents per 100 pounds.

Philadelphia—Sales are down substantially from March, with little prospect of early recovery to last month's level.

Buffalo—Warehouse business generally is unchanged at a fair rate. Buying is for only immediate needs. Expected improvement in demand for structural items has yet to appear.

Cincinnati—Warehouse sales are more numerous, but the average tonnage is smaller, so that volume remains at a level with February and March. Many industrial users are buying only when need is immediate. Competitive conditions have caused price unsteadiness in some items.

St. Louis—Business is quiet, customers either postponing orders or restricting their purchases. Recent price reductions have been without effect on sales. Oil country supplies are moving well and some building items are more active.

Seattle—Slightly improved turnover is reported but seasonal buying continues slow. Sheets and bars are in best demand.

Iron Ore

Iron Ore Prices, Page 92

Cleveland — Cold weather the past two weeks in upper lake regions makes it possible that opening of the iron ore navigation season will be the latest of the past ten years. Temperatures well below freezing keep the Soo canal closed, while Duluth harbor again has frozen solidly after opening up a short time ago. Present indications point to May 1 as the earliest date for ore movement, compared with April 12 last year. In 1936 and 1934, shipments did not start until April 29, but the last time navigation was deferred until May was in 1928, when May 3 witnessed the first movement. In the meantime, inquiries for iron ore still are awaited, while mines in the Lake Superior district are loading ore into cars for delivery to the docks shortly before boat arrivals.

Ore Imports Heavy

Baltimore—Iron ore arrivals in March were the heaviest in recent months, totaling 199,008 tons, against 172,294 tons in February, and 180,637 tons in January. The largest previous total was 220,050 tons in October last year. Shipments last month compared with 101,095 tons in March last year.

Manganese ore arrivals of 18,923 compared with 12,990 tons in February, 39,270 tons in January, and 48,368 tons in March a year ago. Chrome ore imports comprised 1500 tons, all in one shipment.

Ferromanganese imports were substantially heavier than in the preceding month, when only one cargo of 1600 tons came in. Arrivals in March included a lot of 1080 tons from Gdynia, 300 tons from Heroen, 300 tons and 335 barrels from Sauda and another lot of 500 tons and 111 barrels from the same port, 700 tons from Ymuiden, 20 tons Gdynia, another from Sauda, 450 tons, 1263 barrels and 79 drums and from Heroen, 400 tons.

Two shipments of pyrites, both from Huelva, totaled 9187 tons. A shipment of 7750 bags of magnesite came in from Murmansk and 400 bags of fluorspar came from Bordeaux. Shipments of ilmenite sand comprised 13,050 tons.

Philadelphia — Eight thousand tons of chrome ore were received here during the week ending April 8. This tonnage was comprised of two shipments, one from South Africa involving 4200 tons and the other from Cuba involving 3800 tons.

Thirty tons of ferromanganese came in from what was formerly Czechoslovakia and five tons of ferrochrome from Sweden. Fifteen tons of steel tubes and nine tons of steel bars were received from Sweden.

Urges Utilities To Act On Power for Defense

■ Assuring leaders of the nation's electric industry that emergency power for war-time requirements "can be made available without much disturbance to existing systems, and at a very reasonable expenditure," M. W. Smith, manager of engineering, Westinghouse Electric & Mfg. Co., outlined a plan to link the country's power sources, in an address before the recent Midwest Power conference, Chicago.

He suggested private utilities coordinate efforts in tying in the

power capacity between important load centers in an economically practicable manner, "using present methods, facilities and equipment more effectively, and thus preclude the necessity of special government-sponsored trunk lines."

He warned that, if the industry "procrastinates too long the best solution may not be available when the need for a final decision arises, with the consequence that some totally unjustified and unnecessary solution may be forced through by those having political authority but limited experience."

Swedish Stainless Weak

New York—Weakness in stainless steel products is reported in the Scandinavian market. The market on stainless sheets has been 2.75 Swedish kroner per kilo but more recently the price has sagged to 2.54 and displays evidence of further weakness. Swedish sources have offered stainless sheet bars in the American market at 1.20 kroner per kilo. The exchange rate on the kroner is approximately 24.15c.

It is understood that Germany, under its new subsidy plan, will make up 42 per cent of the selling price, against steel sold in the export market.

Men of Industry

(*Concluded from Page* 31)

departments; E. F. Martin, superintendent of Grey mills, Saucon plant, has been made assistant superintendent, Saucon plant; C. A. McGill, assistant superintendent of shape mills, becomes superintendent of these mills.

♦

Walter P. Murphy, president, Standard Railway Equiment Mfg. Co., Chicago, has donated $6,500,000 to Northwestern university, Evanston, Ill., in the name of the Walter P. Murphy Foundation, an Illinois corporation set up to build and equip a new technology unit.

♦

Douglas W. Martin, formerly of Martin Forge Co., has joined the Atlantic Basin Iron Works, Brooklyn, N. Y., and will take over duties in the plant's forge department.

♦

Lloyd R. Earl, for a number of years production manager, Consolidated Steel Corp., Los Angeles, has been elected a vice president.

♦

J. E. Montgomrey, assistant secretary since 1920, Institution of Mechanical Engineers, (Great Britain), has been appointed secretary. He succeeds Brigadier-General Magnus Mowat, who retired because of ill health.

♦

Vernon Whiting, Dallas, Tex., has been appointed sales representative in northern section of Texas for Stearns Magnetic Mfg. Co., Milwaukee.

♦

W. S. Kirkpatrick, formerly distributor for Brunswick-Kroeschell Co. and Carrier Corp., has been appointed supervisor of commercial refrigeration and air conditioning, with headquarters in London, England, by International Standard Electric Corp., subsidiary of International Telephone & Telegraph Corp., New York.

♦

Victor Brook, 433 Rockingham street, Rochester, N. Y., has been appointed exclusive representative in the Rochester, Buffalo, and Jamestown, N. Y., area, by Hall Planetary Co., Philadelphia, maker of precision thread and hole milling machines.

♦

Louis J. Borinstein, of A. Borinstein, Indianapolis, has been named chairman, legislative committee, Institute of Scrap Iron and Steel Inc., New York. Saul S. Frankel, Rochester Iron & Metal Co., Rochester, N. Y., has been made vice chairman.

♦

H. W. Weimer has opened a new "V-Belt Shop" at 2412 West State street, Milwaukee. In addition to Shafer bearings and other products, he will handle Allis-Chalmers Mfg. Co.'s Texrope V-belt drives.

♦

Hermann Waker, since 1930 vice president, American Bosch Corp., Springfield, Mass., and associated with Bosch interests 30 years, has resigned.

♦

J. C. Springer, associated with Cutler-Hammer Inc., Milwaukee, since 1928, serving several years with the company's Cleveland sales office, and the past seven years in the Milwaukee sales office, has been named assistant credit manager.

♦

Byron A. Fay, vice president in charge of production, Electric Auto-Lite Co., Toledo, O., has been elected a director.

♦

H. E. Adelsberger, president, Auto City Plating Co., Detroit, has been elected president, Plating and Rustproofing Association of Michigan.

♦

Russell A. Blanchard has been appointed Detroit district sales representative, Extruded Metals Inc., Belding, Mich. Mr. Blanchard formerly served as purchasing agent, Detroit Brass & Malleable Works, 14 years, and prior to that was director of purchases, Charcoal Iron Co. of America.

♦

Mark G. Mueller, representative in Colorado, western Nebraska, northern New Mexico and Wyoming for Ward Leonard Electric Co., Mount Vernon, N. Y., maker of electric controlling devices, is now located at 1644 Blake street, Denver.

♦

Frank F. Russell has been elected president, National Aviation Corp., succeeding Edward O. McDonell, who has been made chair-

Lee Conveyor SCREWS
are helically coiled bands of metal pitched to requirements, for welding to a shaft. Light in weight; great in strength, toughness and adaptability, they make a preferred method of constructing helical conveyor screws. Promptly available in low carbon steel for all ordinary applications or in 16-18% chrome steel for resistance to corrosion and abrasion. Other metals also available. You are invited to look into the possibilities of this preferred conveyor screw.
Write for Folder
Lee SPRING CO., INC.
30 MAIN STREET BROOKLYN N Y

man of the board. S. F. Christy has been named secretary and assistant treasurer.

♦

John F. Callahan, since 1921 a member of the advertising staff of Air Reduction Sales Co., New York, has been appointed assistant advertising manager.

♦

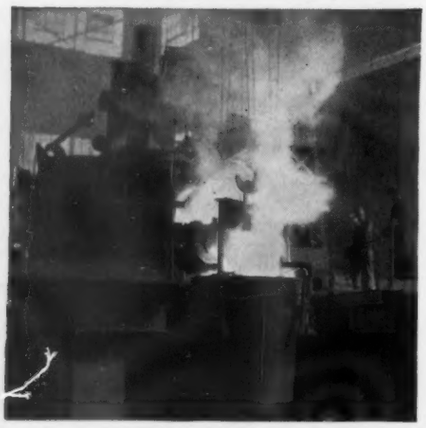
Frank M. Smith, vice president and general manager, Stout Engineering Laboratories Inc., Dearborn, Mich., has been elected to the board of directors of Hupp Motor Car Corp., Detroit.

♦

Jesse Marsten has been elected a vice president, and Harry A. Ehle, assistant to the president, International Resistance Co., Philadelphia. Mr. Marsten will continue as chief engineer, a position he has held many years, while Mr. Ehle, in addition to his new duties will remain in charge of industrial division sales.

BASIC ELECTRIC STEEL

FORGINGS



N. F. & O. Basic Electric Steel produced under rigid metallurgical control is an important *quality* factor in the ultimate forged product

BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finished Machined, Heat Treated to Specifications ...Forging Quality Ingots, Pressed or Hammered Billets.

Die Blocks & Piston Rods

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

Nonferrous Metals

New York — Uncertainties arising from the European crisis continued to dominate developments in nonferrous markets last week. Due mainly to sharp increases in war risk insurance rates and possible increases in the immediate future, sellers were reluctant to offer tin futures and prices moved higher. Weakness in London, coupled with dull demand here, resulted in a further cut of ¼-cent in smelters' quotations for electrolytic copper. Buying in all metals tapered because of unwillingness to make more than necessary commitments in the face of growing tenseness in Europe.

Copper — Smelters lowered prices to the basis of 10.50c, Connecticut, for electrolytic, while primary mine producers held quotations unchanged at 10.75c. Export copper sold as low as 10.10c, c.i.f. European ports, and closed near the low. World refined stocks of copper increased 13,277 tons further during March to 506,391, the highest since July, 1938. Domestic stocks increased 11,538 tons. Brass mill operations are holding steady at about 60 per cent of capacity.

Tin — Some improvement was noted in tin sales as consumers showed increasing concern over their reserves in case of major hostilities on the Continent. Straits spot advanced steadily from 46.00c early in the week to a high of around 46.70c at the close.

Lead—Most sellers of lead booked their daily intake on business which was placed by consumers late in the day after all the day's developments were reviewed. Prices were lowered $2 per ton on Tuesday to the basis of 4.60c, East St. Louis.

Zinc — Although daily sales reports were generally disappointing, it was estimated that a moderate tonnage, possibly 2000 tons, was booked during the week. Continued low prices in London prevented domestic producers from adjusting their quotations to a more profitable level. All sellers continue to quote on the basis of 4.50c for prime western.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.

April	Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
8	10.75	11.37½	10.00	46.15	46.15	4.85	4.70	4.50	20.00	11.50	35.00
10	10.75	10.87½	10.00	46.20	46.20	4.85	4.70	4.50	20.00	11.50	35.00
11	10.75	10.75	10.00	46.00	45.85	4.75	4.60	4.50	20.00	11.50	35.00
12	10.50	10.75	10.00	46.25	46.10	4.75	4.60	4.50	20.00	11.50	35.00
13	10.50	10.75	10.00	46.50	46.50	4.75	4.60	4.50	20.00	11.50	35.00
14	10.50	10.75	10.00	46.70	46.70	4.75	4.60	4.50	20.00	11.50	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.75c Conn. copper

Sheets

Yellow brass (high)	16.98
Copper, hot rolled	18.87
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	19.73
Seamless copper	19.37

Rods

High yellow brass	12.31
Copper, hot rolled	15.37

Anodes

Copper, untrimmed	16.12

Wire

Yellow brass (high)	17.23

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	5.87½-6.12½
Cleveland	6.75-6.87½
Chicago	6.25-6.50
St. Louis	6.00-6.25

Heavy Copper and Wire

New York, No. 1	7.87½-8.00
Cleveland, No. 1	7.87½-8.00
Chicago, No. 1	7.62½-7.87½
St. Louis	7.75-8.00

Composition Brass Borings

New York	5.12½-5.37½

Light Copper

New York	6.37½-6.62½
Cleveland	6.12½-6.25
Chicago	6.25-6.50
St. Louis	6.25-6.50

Light Brass

Cleveland	3.75-3.87½
Chicago	4.00-4.25
St. Louis	3.75-4.00

Lead

New York	4.10-4.35
Cleveland	3.50-3.75
Chicago	3.60-3.85
St. Louis	3.50-3.75

Zinc

New York	2.50-2.62½
Cleveland	2.00-2.25
St. Louis	2.00-2.25

Aluminum

Borings, Cleveland	6.25-6.50
Mixed, cast, Cleveland	7.75-8.00
Clips, soft, Cleveland	14.75-15.00
Mixed cast, St. Louis	7.75-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	10.50
Standard No. 12 aluminum	12.50-13.00

POUR A FULL INGOT

INSTEAD OF A BUTT

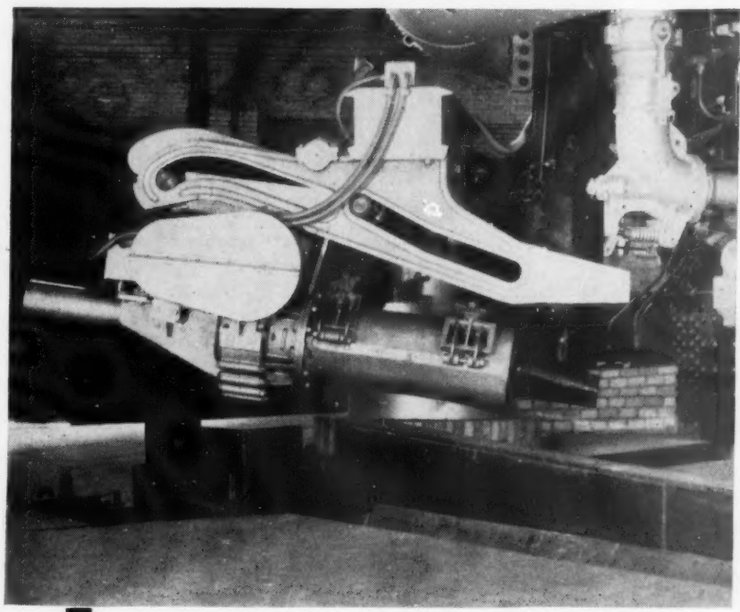
Liquitol . . . makes possible a reduction of up to THREE INCHES in hot top metal necessary to feed ingot.

This means that at end of pour you have enough metal to pour a FULL INGOT—instead of a Butt

Eliminates PIPING, CAVITIES & POROSITY in your Ingots
SAVES — Money, Time, Labor — Eliminates Waste

THE ALPHA-LUX COMPANY, INC.

192 FRONT STREET *Ask for Bulletin AL-22* NEW YORK CITY



Furnace Men!

TAPPING HOLE TROUBLE DISAPPEARS

A STRONG FRONT IS SECURED
NO NEED TO BLANK TUYERES
NO DELAYS AT CASTING TIME
NO INTERRUPTION TO STEADY STOCK DESCENT
NO VARIATION IN POSITION OF TAPPING HOLE
LONGEST LIFE AND LEAST MAINTENANCE

BRASSERT THREE-MOTOR TAPPING HOLE GUN

write for bulletin to

H. A. BRASSERT & COMPANY 310 So. Michigan Avenue **CHICAGO**

Equipment

Chicago—Machinery interests report actual business booked last week was little changed in volume, but inquiries have slipped off noticeably, presaging quiet in the next few weeks. Sentiment among buyers is suffering from effects of the foreign situation and the stock market. April sales of equipment will be less than in March, it is freely forecast.

Washington—The navy awarded contracts April 12 totaling $487,000 for electric overhead traveling cranes for various navy yards. The largest order, $348,212, went to Harnischfeger Corp., Milwaukee, for cranes for yards at Puget Sound, Boston, Charleston, Brooklyn, Norfolk and Philadelphia. Other contracts included one to Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., two 175-ton cranes for the Philadelphia yard, $125,600.

Seattle — Mining operators are buying seasonal requirements. Electrical and pumping equipment and road machinery are in good demand. Bonneville authority has opened bids for 4150 feet of galvanized steel pipe and fittings, 3300 feet of wrought steel pipe, weight bars and for furnishing three heavy duty winches and 10,500 feet of steel wire rope and chokers. Same office has called the following: April 21, switchboards for five substations, No. 242; ground wire, rods, connectors, etc., No. 241; April 22, 475,000 feet wire and fittings, No. 258; April 24, bus and ground materials for substation, No. 255; May 1 for construction of substation and underground ducts.

Construction and Enterprise

Ohio

CINCINNATI—Standard Oil Co. has plans in progress for constructing a centralized distributing plant at estimated cost of approximately $400,000.

GREEN SPRINGS, O.—Village, Ira Young, mayor, is completing plans and will soon receive bids, to be due about April 28, in waterworks improvement project costing $45,000. Consulting engineer, Floyd Browne, Marion, O.

HUBBARD, O.—City, C. F. Harder, clerk, is completing revised plans for constructing a waterworks costing about $52,000. Involves water softening plant, two deep well turbines, centrifugal pumps, wash pumps, mains, filters and chemical equipment. Consultant, E. D. Barstow, Akron, O.

MILAN, O.—Village, H. C. Moore, mayor, has approved bond issue and is preparing plans to construct an Imhoff-type sewage treatment plant costing approximately $120,000. Clarence Voight, Sandusky, O., consulting engineer.

PIQUA, O.—City, R. V. Buechner, manager, will probably soon advertise for bids in installation of miscellaneous power plant equipment costing $26,000. Albert Schroeder, city engineer.

Connecticut

MERIDEN, CONN. — International Silver Co. is receiving bids in construction of a two-story, 50 x 60-foot boiler plant costing approximately $40,000.

STORRS, CONN.—State, R. A. Hurley, commissioner of public works, Hartford, Conn., has revised plans and will soon take bids for building a brick, steel and concrete central heating plant costing $160,000. PWA project. F. J. Dixon, Hartford, engineer.

Rhode Island

PAWTUCKET, R. I.—City water filtration commission, Mayor T. P. McCoy, chairman, is asking bids due April 24 in the construction of a water filtration plant costing $500,000. PWA funds allotted. C. A. McGuire, Providence, R. I., consulting engineer.

Pennsylvania

ERIE, PA.—City, Charles R. Barber, mayor, has completed plans and specifications for projected construction of a chlorination plant, containing 18 chlorinating tanks, to cost $17,000. Alexander Aitken, city engineer.

Michigan

DETROIT—Divco Twin Truck Co. has awarded contract to W. E. Wood Co., 4649 Humbolt avenue, for constructing a one-story, 248 x 500-foot truck plant estimated to cost approximately $225,000. Considerable equipment will be installed. (Noted Feb. 6.)

PORTLAND, MICH.—Tri-county Electric Co-operative Inc., Dolph Wolf, superintendent, is completing plans and will be ready for bids about May 6 on construction of 95 miles rural electric power lines in four counties at cost of $100,000.

ROCHESTER, MICH.—Village, S. Q. Ennis, clerk, asks bids until April 24 in the proposed construction of a primary sewage treatment plant estimated to cost about $87,500. PWA funds granted. Ayres, Lewis, Norris & May, Ann Arbor, Mich., consulting engineers.

Illinois

AURORA, ILL.—Austin-Western Road Machinery Co. is taking bids in proposed construction of a plant to cost about $50,000. E. O. Sessions Co., Chicago, consulting engineer.

CHICAGO—Comstock Staplin Inc. has been organized with 1000 shares no par value common stock to manufacture and distribute iron and steel and other metals. Correspondent, Paul Denvir, 1 North La Salle street.

NEWTON, ILL.—Norris Electric cooperative has been allotted a $240,000 loan by REA for constructing some 215 miles of rural electric power transmission lines through six counties.

Alabama

MOBILE, ALA.— City, Charles Baumhauer, mayor, receives bids April 21 for installing complete conveyor system at bulkhandling plant, Alabama state docks. J. B. Converse & Co. Inc., Mobile, engineer.

District of Columbia

WASHINGTON — Navy department, yards and docks, asks bids to April 26 for a 25-ton diesel electric revolving crane for installation in Charleston, S. C., navy yard. Spec. 8992.

Mississippi

PASCAGOULA, MISS.—Jackson county board of supervisors will take bids May 1 for building a 150,000-gallon steel water tank and furnishing various equipment for water system. L. C. Winterton, Pascagoula, consulting engineer.

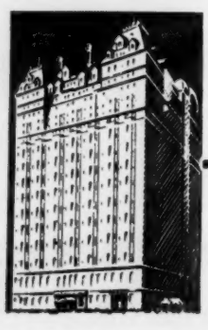
Virginia

PEARISBURG, VA.—Celanese Corp. of America, W. M. Cameron, executive vice president, 180 Madison avenue, New York, will soon let contracts for con-

WORLD OVER

There's just **ONE**

Bellevue-Stratford—incomparably distinguished . . . the rendezvous of people who do important things . . . the very center of Philadelphia's social and business life. Reasonable rates.



BELLEVUE-STRATFORD

IN PHILADELPHIA

CLAUDE H. BENNETT, *General Manager*

• *Be sure to include historic Philadelphia in your itinerary*

SCREENS
of Perforated Metal

The Harrington & King PERFORATING Co.

5634 Fillmore St., Chicago, Ill.
New York Office—114 Liberty St.

JIGS—FIXTURES—SPECIAL MACHINES—PUNCHES—DIES—"*to your measure*"!

Let our trained engineers apply our 33 years' experience to your equipment problem. Our successes in other plants of all types, and proved methods assure a solution of any question involving production machinery. Write us in detail without obligation.

THE COLUMBUS DIE, TOOL AND MACHINE CO.
COLUMBUS, OHIO

ASK FOR INFORMATION AND QUOTATIONS ON

OHIO

LIFTING MAGNETS—Improved Design—Greater Lifting Capacity
SEPARATION MAGNETS—Stronger Pulling Capacity
MAGNET CONTROLLERS—With Automatic Quick Drop

THE OHIO ELECTRIC MFG. CO.
5906 MAURICE AVE. CLEVELAND, OHIO

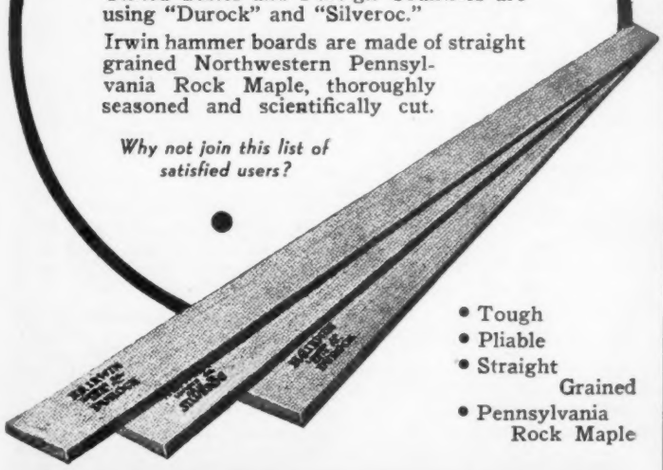
IRWIN
HAMMER BOARDS

will prove the answer to your hammer board problems.

Hundreds of forge shops in both the United States and Foreign Countries are using "Durock" and "Silveroc."

Irwin hammer boards are made of straight grained Northwestern Pennsylvania Rock Maple, thoroughly seasoned and scientifically cut.

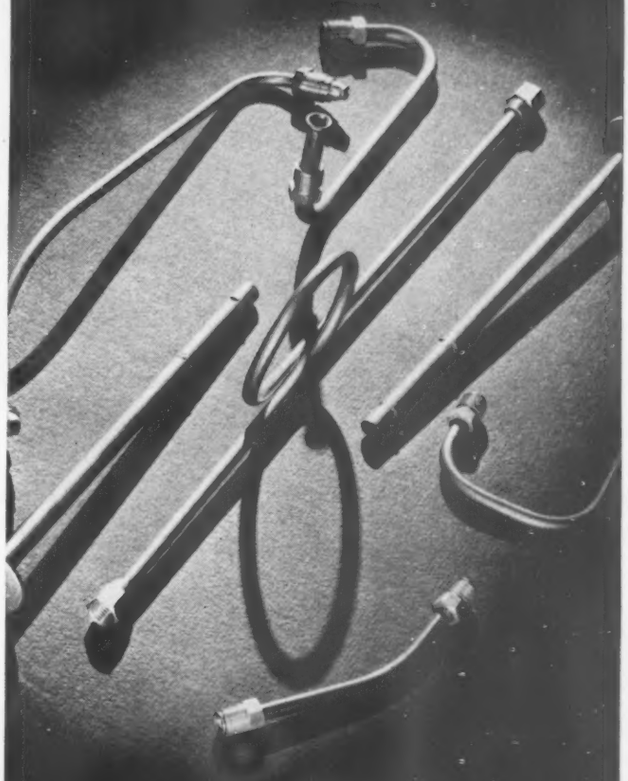
Why not join this list of satisfied users?



- Tough
- Pliable
- Straight Grained
- Pennsylvania Rock Maple

H.G. IRWIN LUMBER CO., ERIE, PA.

BUNDY TUBING



. . . Wherever great strength and resistance to vibration are required

BUNDY TUBING CO.
DETROIT

structing the first unit, costing $750,000, in its projected $10,000,000 plant.

Missouri

AFFTON, MO.—City has $178,517 WPA grant in the projected construction of a complete sewerage system and sewage disposal plant at estimated cost of $218,-391.

KIRKWOOD, MO.—City is taking bids to 10 a. m., April 21, on constructing one-story power plant, installing sub-station transformers, switchgear, regulators, wiring and voltage regulators. Black & Veatch, Kansas City, Mo., consulting engineers. (Noted April 3.)

REPUBLIC, MO.—City, H. Owen, mayor, plans to build a sanitary sewerage system and complete sewage disposal plant at total cost of about $90,-000. J. Robinette, Springfield, Mo., consultant.

SPRINGFIELD, MO.—Laclede County Electric co-operative has been allotted $158,000 REA loan for constructing 152 miles of rural electric power transmission lines through five counties.

Wisconsin

BOSCOBEL, WIS.—Tri-state Power co-operative has plans underway for building in five counties rural power lines whose cost will total $478,000.

Minnesota

HALSTAD, MINN. — Village, Anthony Opgrand, clerk, takes bids to 2:30 p. m., April 25, for constructing a power plant with diesel engine generating equipment, switchgear, distribution system and auxiliaries. Certified check 5 per cent to accompany bid. Engineers, G. M. Orr & Co., Minneapolis. (Noted Jan. 23.)

RED LAKE FALLS, MINN.—Red Lake co-operative has appointed Ellerbe & Co., St. Paul, consulting engineers, in project for constructing about 240 miles of rural electric power transmitting lines. (Noted March 13.)

RED WING, MINN.—City board of water commissioners, S. T. Irvine, clerk, takes bids to 7:30 p. m., April 25, in the projected installation of a 312-kilovolt amperes alternator and motor for water pumping service. Certified check 10 per cent to accompany bids. J. F. Enz, city engineer.

STEWARTVILLE, MINN.—Village, G. W. Ellis, recorder, receives bids until 2 p. m., April 21, on construction of a sewage treatment plant and pumping station. Certified check 15 per cent to accompany bid. Druar & Milinowski, St. Paul, consulting engineers.

WORTHINGTON, MINN.—City, G. S. Thompson, clerk, is accepting bids to 8 p. m., April 26, for furnishing and installing in its power plant a new turbo-generator, condenser, switchgear and auxiliary equipment. Certified check 10 per cent to accompany bid. Ralph D. Thomas & Associates, Minneapolis, consulting engineers.

Texas

CONVERSE, TEX.—Guadalupe Valley Electric co-operative, M. G. Prochnow, representative, is asking bids in construction of 198 miles of rural power transmission lines in four counties at cost of about $157,000. Has REA allotment. W. G. Morrison, Waco, Tex., consultant.

HOUSTON, TEX.—Bethlehem-International Supply Co. has awarded contract to Southwestern Construction Co., 3802 Calhoun street, for building a 264 x 320-foot warehouse. Will install four overhead electric cranes. W. L. Kane, resident engineer.

Nebraska

WYMORE, NEBR. — City, H. Janke, commissioner, is preparing plans for improving its power plant at estimated cost of $150,000. E. H. Dunmire, Lincoln, Nebr., consulting engineer.

Kansas

FT. RILEY, KANS.—Construction quartermaster, Ft. Riley, is taking bids due April 24 for three 7½-kilovolt amperes transformers and one 75-kilovolt amperes unit.

KANSAS CITY, KANS.—Food terminal will build a 140 x 360-foot cold storage building costing $660,000. Maturity soon. W. F. Schulz, Memphis, Tenn., consulting engineer.

Iowa

CALLENDER, IOWA—City is taking bids to April 21 on projected construction of a waterworks system, including deep well, tank, and pump house. Currie Engineering Co., Webster City, Iowa, consultant.

DUNCOMBE, IOWA — City, John W. Brown, clerk, takes bids until 1 p. m., May 12, on power system changes involving: Section 1, new switchboard, and Section 2, electrical distribution system, complete with meters and auxiliaries.

MUSCATINE, IOWA—City plans to erect a 300,000-gallon water reservoir, relocate present pumping equipment and laying new water mains. Estimated cost is $37,177. Seeks federal funds.

Montana

LEWISTOWN, MONT.—City, George J. Waltz, clerk, takes bids to 8 p. m., April 20, on constructing complete sewage disposal plant, estimated to cost $55,000. Certified check 5 per cent to accompany bid. J. M. Schmit, city engineer. (Noted Feb. 27.)

Pacific Coast

BURBANK, CALIF.—Chicago Pneumatic Tool Co., Chicago, proposes to construct and equip a factory here, principally for supplying the aircraft industry.

BONNEVILLE, OREG.—United States engineer is receiving bids to April 25 for circuit breakers, accessories and parts for the powerhouse at Bonneville dam. Inventory 694-39-123.

PORTLAND, OREG.—Bonneville power project, 811 Northeast Oregon street, takes bids until April 20 for service panel circuit breaker, switches, battery charger, relays etc., for North Vancouver, Wash., power substation. Inventory 240.

SEASIDE, OREG.—City, Gault Patton, auditor, will receive bids April 28 for constructing Unit 2 in its sewage disposal plant project, at estimated cost of $80,000. Stevens & Koon, Portland, Oreg., consulting engineers.

WESTPORT, WASH.—Voters have approved proposal to issue $50,000 bonds for financing construction of waterworks, reservoir and distributing system.

Canada

CALGARY, ALTA.—Imperial Oil Ltd., Sarnia, Alta., is completing plans for building a refinery costing $1,750,000. Propose to begin work this month.

NEW TORONTO, ONT.—Canadian Industries Ltd., Montreal, Que., is rebuilding its fabrikoid plant and adding to its solvents recovery system at total cost approximating $150,000.

TORONTO, ONT.—Willys of Canada Ltd., Windsor, Ont., is negotiating for a site for constructing projected assembly plant to cost $150,000.

CHICOUTIMI, QUE.—Aluminum Co. of Canada Ltd., Montreal, Que., will soon receive bids in the projected construction of a factory costing $200,000.

OUR AIM is to render service. A little more complete... more hospitable... more pleasing ... than even the most exacting guest expects.

CHAS. H. LOTT
Manager

Every Room Outside with Private Bath
Single from $2.50
Double from $4.00

DETROIT LELAND HOTEL

CASS AT BAGLEY AVE.
GARAGE IN CONNECTION

READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

STEEL Gave the Answers

To the Editor:

In the April 10 issue of STEEL I found in the article on "Pure Iron Powder" the answers to many questions that had been floating around in my mind. I had thought that research work had been done along the lines there pointed out but I found no way of learning what had been done, by whom and the possible future developments that should be accomplished.

BRUCE PAYNE

Industrial Engineer,
National City Bank,
Cleveland

Earnings Chart Best Ever

To the Editor:

I want to compliment STEEL on the article in the issue of April 10 captioned "Steel Industry's Earnings Insufficient to Pay Funded Debt Interest in 1938," and especially on the financial analysis chart.

You put out excellent charts in previous years but this is the best. It is a valuable assembly of figures for every steelmaker and of immediate interest.

A. W. MACE

Assistant Secretary-Treasurer,
Allegheny Ludlum Steel Corp.,
Brackenridge, Pa.

Congressman on Machines

To the Editor:

I do not wish to be regarded as one who is opposed to progress or unmindful of the benefits machinery has brought to mankind, and especially to this nation. I realize that in the regulation of machinery, so as to alleviate the ill effects of its resultant displacement of labor, that we have a tremendous problem. Nevertheless, I believe it is impossible for this country to prosper with as many unemployed as we have at present. An unemployed man is either a non-consumer or a very limited consumer and the theory of technological advancement is to create consumption. If it fails to do this, it is a failure.

I realize that machinery has brought a great many commodities within the reach of the mass of consumers. However, I believe at present we are super-saturated with machinery and that this condition has prevailed for the past 15 years. Whether this condition will be permanent or not, I am not prepared to say, but it is permanent enough at present to merit serious consideration, which it is not receiving.

In the second paragraph of your editorial (STEEL, March 27, p. 34) you remark concerning the tax load upon industry. A great deal of this tax load is necessary because of the relief caused by displacement of labor by machinery. One of my greatest fears regarding machinery is the tendency of a great many to refuse to look at the true facts surrounding the problem. For instance those in favor of machinery resort to trick figures and theoretical answers to prove that machinery produces more jobs than it displaces.

Nevertheless, we have the unemployed, which is a concrete condition and cannot be eradicated by trick figures or abstract arguments. Then we have another class, all too prevalent in this nation today, who believe anything can be solved by a paternalistic program. To illustrate, one of my colleagues the other day, following some remarks I made on the floor of the house regarding this matter, said to me: "You have not thought this matter through. We can take care of the unemployed by decreasing hours and by taxing the machinery to keep the workers displaced."

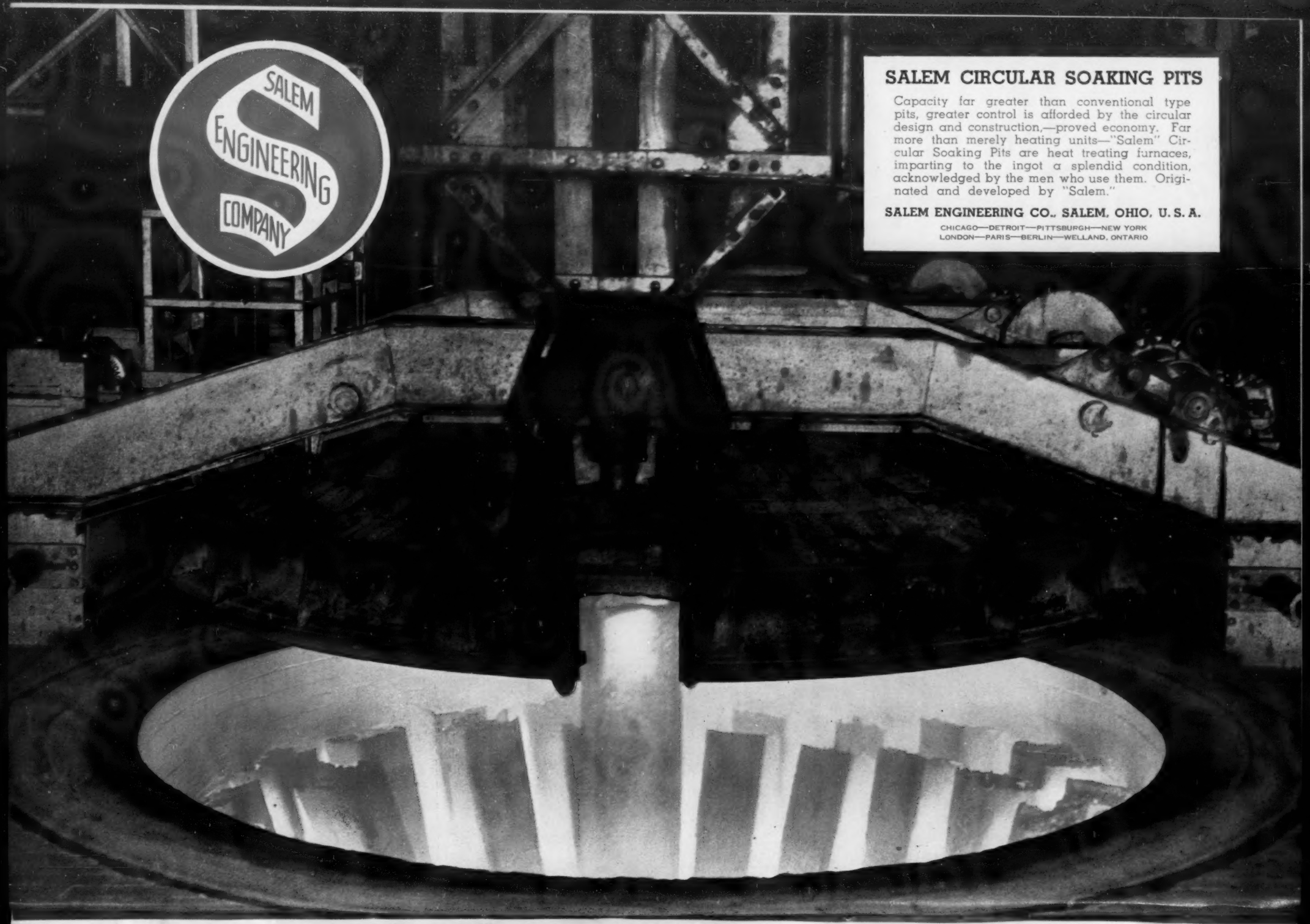
His ignorance was so colossal that I did not bother to ask him if he had ever heard of the law of diminishing returns. Nevertheless, he represents, I fear, the viewpoint of a majority of voters of this nation, who, whether their ideas are economically sound or not, seem to be able to put them into effect.

I do not believe this problem can be solved by putting more machines to work. I believe that was true in the past, but we have reached a point where production has far outdistanced our ability to consume. Neither do I believe that our ability to consume can be increased by any such panaceas as the Townsend old age pension, currency inflation, or anything else.

I do believe that machinery can be classed as three kinds: First, that which is really work-producing, such as the automobile, the radio and like machinery; second, that which goes to save men from being put at hard, arduous, dangerous toil; third, that which displaces labor merely in the interest of time. It is this third class that rushes industry for a short time and necessitates a shutdown during the rest of the year.

It has not cheapened the product or resulted in increased consumption. It results in putting men to work with a rush for two or three months at high wages, which they spend as they make them, and for the remaining months they must go on the WPA or live on credit in very reduced circumstances. Most certainly the nation as a whole would be better off if this work were

(*Please turn to Page* 87)



SALEM CIRCULAR SOAKING PITS

Capacity far greater than conventional type pits, greater control is afforded by the circular design and construction,—proved economy. Far more than merely heating units—"Salem" Circular Soaking Pits are heat treating furnaces, imparting to the ingot a splendid condition, acknowledged by the men who use them. Originated and developed by "Salem."

SALEM ENGINEERING CO., SALEM, OHIO, U. S. A.

CHICAGO—DETROIT—PITTSBURGH—NEW YORK
LONDON—PARIS—BERLIN—WELLAND, ONTARIO